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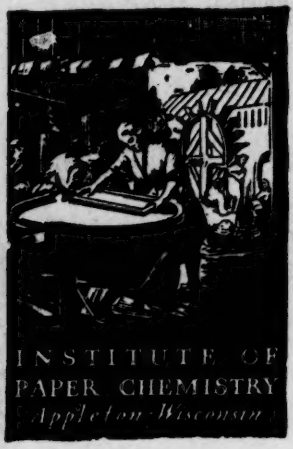
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

SEPTEMBER • 1953

Volume 24 Number 1

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Books and Pamphlets Added to the Library During August

ADHESIVES—TESTING

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on testing adhesives for durability and permanence. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 26, 1952. ASTM special technical publication no. 138. Philadelphia, The Society [c1953] 60 p.

AIR CONDITIONING

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on conditioning and weathering. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 24, 1952. ASTM special technical publication no. 133. Philadelphia, The Society [c1953] 98 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 unfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1953. 21. Band. 567 p.

ENGINEERING—CONTRACTS AND SPECIFICATIONS

MEAD, DANIEL W. Contracts, specifications and engineering relations, with a chapter on contracts by Frank Jenks. 2d ed. New York, McGraw-Hill Book Co., 1933. 557 p.

FATIGUE

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on fatigue with emphasis on statistical approach—II. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 24, 1952. ASTM special technical publication no. 137. Philadelphia, The Society [c1953] 91 p.

INDEXES

SPECIAL LIBRARIES ASSOCIATION. *The Science-Technology Group. Special Libraries Council of Philadelphia and Vicinity,* comp. Correlation index document series and PB reports. Comp. with the cooperation of Office of Technical Services. Ed. by Gretchen E. Runge. New York, The Association, 1953. 271 p.

PAPER MAKING AND TRADE

The PULP and paper manual of Canada; a publication that keeps

pace with current developments in equipment, describes ideas for maintaining of plant machinery and provides a catalogue of the equipment and supplies available to the pulp and paper industry, with an extensive classified index of equipment and supplies. 21st ed. Gardenvale, Que., National Business Publications Ltd., 1953. 452 p.

PAPER WORK

SCHNEIDER, HERMAN, and SCHNEIDER, NINA. Science fun with milk cartons. Pictures by Jeanne Bendick. [New York, Whittlesey House, McGraw-Hill Book Co., c1953] 159 p.

PATENT LAWS AND LEGISLATION

COSTA, JASPER SILVA. The law of inventing in employment. New York, Central Book Co., 1953. 336 p.

PATENTS

PALMER, ARCHIE M. University patent policies and practices. National Research Council. Patent Policy Survey. Publication 257. Washington, The Council, 1952. 229 p.

PHYSICS

PHYSICAL SOCIETY OF LONDON. Reports on progress in physics. Executive editor, A. C. Stickland. London, The Society, 1953. v. 16 (1953). 407 p.

PLASTIC MATERIALS—TESTING

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on plastics testing—present and future. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 26, 1952. ASTM special technical publication no. 132. Philadelphia, The Society [c1953] 71 p.

PRINTING

The PENROSE ANNUAL, a review of the graphic arts. Ed. by R. B. Fishenden. New York, Pelligrini & Cudahy, 1953. v. 47. 140 p. + numerous illustrations.

WATER—ANALYSIS

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on continuous analysis of industrial water and industrial waste water. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 24, 1952. ASTM special technical publication no. 130. New York, The Society [c1953] 54 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

LOVE, R. M. Spectroscopic studies of carbohydrates. 1. The action of sulphuric acid on sugars. Biochem. J. 55, no. 1: 126-32 (August, 1953).

The conversion of several sugars to furan derivatives at 60°C. in 28.3 *N* sulfuric acid was followed spectroscopically. Variations in the apparent yields and in the shapes of the absorption spectra were attributed to two other absorbing compounds, which were formed at the expense of the furan derivatives in amounts dependent on the configuration of the sugars. Another by-product was formed by three of the sugars when 37.1 *N* sulfuric acid was used. Its absorption exceeded that of the furfural and caused a complete change in the appearance of the spectra. The colors formed when sugars were heated at 100° in 28.3 *N* sulfuric acid were found to be due to three main absorption bands. The nature of the absorbing substances is discussed. 2 tables, 3 figures, and 11 references. E.S.

AIR CONDITIONING

JOBST, WILHELM. Air conditioning in paper manufacture and conversion. Wochbl. Papierfabrik. 81, no. 4: 115-17 (Feb. 28, 1953). [In German]

Modern air-conditioning equipment and installations for the maintenance of the correct humidity and temperature during summer and winter and for the removal of dust are described. 6 figures. E.S.

ALKALINE PROCESSES

ANON. Wood in the kraft mills of the United States. The application of the sulfate process in the United States. Papeterie 75, no. 5: 339, 341, 343, 345; no. 6: 397, 399, 401 (May, June, 1953). [In French] *cf.* B.I.P.C. 23: 736.

American practices in charging digesters, cooking, blowing the cook, pulp washing, and automatic control and instrumentation in sulfate mills are reviewed. 21 footnotes. E.S.

ALKALINE PROCESSES—FURNACES

HOCHMUTH, F. W. New developments in recovery unit design. Tappi 36, no. 8: 359-66 (August, 1953).

A review of recent recovery-unit installations indicates that there has been no basic change made in the design of this equipment since the vertical-tower type of unit was first developed during the period between 1937 and 1940 by Combustion Engineering-Superheater, Inc. However, in the past 10 years many improvements have been made on this basic design. These improvements have resulted in a reduction of the operating labor and maintenance chargeable to the recovery unit/ton of pulp production. One of

the most recent developments has been the introduction of an improved superheater design. In this design the superheater tubes making up each element are arranged tangent to each other so as to form a wider spacing than previously used. This new arrangement has resulted in a superheater which is less susceptible to slag accumulations and which permits easier removal of slag formations by standard soot blowers. Operating experience with this type of superheater surface has indicated that the necessity for hand lancing in this section has been eliminated completely. Recovery-unit capacities have been increasing steadily and, at the present time, specifications calling for units of 350 to 400 tons capacity are not uncommon. To obtain more satisfactory heat and power balances, mill designers have been requesting higher steam pressures and temperatures. For the most part their requests have been satisfied and, at the present time, there are several recovery units installed and operating with steam conditions of 850 p.s.i. and 825°F. 10 figures and 1 reference. E.S.

WALLEZE, S. F. Recovery boiler cleaning. Paper Mill News 76, no. 28: 15-17 (July 11, 1953); Can. Pulp Paper Ind. 6, no. 7: 10-11, 30 (July, 1953); Pulp and Paper Manual of Canada 21: 23-5 (1953).

The author describes existing systems for cleaning recovery boilers, the factors which affect their efficiency, and trends in the use of equipment. The application of the retractable-type blower is gaining favor. Although both air- and electric-driven equipment is equally dependable, the percentage of the electric-driven equipment is on the increase. Steam and air are both effective cleaning media; however, maintenance of air-blowing equipment is lower. Where air-blowing equipment is used initially, stand-by steam should be available in the event of a compressor failure; both blowers and controls should be able to use either air or steam with no change to the blowers themselves. Blowers should be selected on the joint recommendation of the blower and boiler manufacturers, and the operating experience of the mill personnel should also be taken into account. E.S.

ALKALINE PROCESSES—ODOR TROUBLE

MAY, BEN F. Experiences in the abatement of kraft mill odors. Tappi 36, no. 8: 374-8 (August, 1953).

The experiences of Gulf States Paper Corp. with the odor problem since the mid 1920's are presented. A historical presentation is given with the idea that the rest of the industry may gain in knowledge from experiences of this mill. The use of a direct condenser for digester blow gases was the first success toward odor abatement. Chlorine was tried for deodorizing the condenser effluent but was found to be ineffective. Until 1951 all attempts at odor abatement were made with condensers, water-spray scrubbers, and improved processing equipment. Trials of odor-masking aromatic compounds began in the fall of 1951. Efforts to effect a milder and less obnoxious odor by the use of these compounds have produced a slight trend toward abating odors. However, positive conclusions are awaiting the results of extended trials. A future study involving the trial of a scrubber system, employing bleach-plant waste liquors, is under consideration. The evaluation of results is the most difficult phase in this field of study. A practical, yet accurate, means of odor measurement is needed. The variables involved are quite complicated, including such major ones as process operating efficiency, meteorological conditions, the nasal characteristics of individuals, and mixing of odors from various sources. E.S.

TREMAINE, BRECKINRIDGE K. Masking air-borne malodors—utilization of aromatic chemicals in industrial odor abatement.

Tappi 36, no. 8: 143-6A (August, 1953); *cf.* B.I.P.C. 23: 621-2.

The author describes the application of Alamask odorants for masking airborne malodors in the pulp and paper industry by (1) spraying, vaporizing, or atomizing the selected odorant into the air-gas stream; (2) adding directly to the process; (3) adding to scrubbing liquors; and (4) spreading or floating on contaminated surfaces without dilution. In pulp operations, the odorants are best used according to method (2). The influence of weather and its many variables on the application of odorants is discussed briefly. 1 reference. E.S.

ALKALINE PROCESSES—RECOVERY

VASSIE, JOHN E. The use of sulphur in kraft pulp mills. Tappi 36, no. 8: 367-8 (August, 1953).

The improvement in the recovery of sulfur has not kept pace with the recovery of soda. In an effort to utilize elemental sulfur more economically, the use of liquid sulfur has been investigated. The addition of sulfur in the liquid state to kraft pulp mill recovery furnaces has been found to have several advantages over conventional methods of addition. Liquid addition permits better utilization of the sulfur in the furnace in that it can be added conveniently on a semicontinuous basis. This is not the case when lump sulfur is handled manually. It has been found that sulfur consumption can be reduced by this more efficient method of handling. E.S.

ALPHA PULP

AMÉEN, WALTER L. Dissolving wood pulps. Svensk Papperstidn. 56, no. 14: 538-47 (July 31, 1953). [In English; French and German summaries]

A historical review is presented of the world production of dissolving pulp (I) since 1904, when this grade of pulp was first produced at Bøhnsdalen in Norway at which time the mill was owned by British interests. The manufacture of (I) in Sweden dates back to 1919; it reached its peak in 1951 with a production of 426,000 tons (all data in this article are given in metric tons). The 12 different Swedish producers of (I) with an estimated production capacity of 350,000 tons/year (which, if desired may be raised to 570,000 tons/year) are listed. The mills normally use only 60% of their capacity for (I); the balance is bleached sulfite paper pulp. Data on world production, consumption, and expansion of (I) are included. Developments in quality are reviewed, and the distribution of the various grades is discussed. In Sweden, approximately 40% of (I) are standard quality (83-90% α-cellulose), 50% super grades (90-93% α-cellulose), and 10% high alpha pulps (94-98% α-cellulose); the corresponding figures for the United States are: 44% cellophane pulp, 23% regular-tenacity viscose pulp, 22% high-tenacity viscose pulp, and 11% acetylation grade. Swedish (I)-manufacturing practices are outlined briefly; sulfite sprucewood pulp is used almost exclusively. Only one mill, Uddeholms AB, makes a prehydrolyzed sulfate pulp from pine, in addition to spruce sulfite (I). In conclusion, price variations in viscose pulp between Scandinavia and the United States (including data on cotton linters and cotton) are discussed. 14 tables, 2 diagrams, and 9 references. E.S.

ALUMINUM

BREMER, GENE. Aluminum foil packaging—post-World War II developments. Ind. Rept. Containers and Packaging 6, no. 2: 4-8 (Summer, 1953); Am. Paper Converter 27, no. 8: 18-20 (August, 1953).

The history of the use of aluminum foil in the packaging industry is

outlined, including uses as labels, in the baking and frozen-food industries, and laminated to polyethylene bags. 2 tables and 1 figure. R.A.S.

ASPLUND PROCESS

AMERICAN DEFIBRATOR, INC. New device for feeding wood chips. Can. Pulp Paper Ind. 6, no. 7: 40 (July, 1953).

A new feeding device (essentially a cylindrical rotary valve) for the introduction of wood chips or other lignocellulosic raw materials into high-pressure cooking or preheating vessels is described briefly; it was designed primarily for use with semichemical operations using the Asplund Defibrator. E.S.

ASPLUND, ARNE. The origin and development of the Defibrator process. Svensk Papperstidn. 56, no. 14: 550-8 (July 31, 1953). [In English]

The technical development of the Defibrator unit since the first experiments in 1931 to its present form and construction is described. Pulp characteristics and uses (fiberboard, flooring and roofing felt, semichemical pulp, treatment of waste paper, wood saccharification, and refining of paper pulp) are discussed. The fact is mentioned that the Defibrator or Asplund process is now used in 175 different plants in 28 countries; the combined yearly capacity is almost three million metric tons of pulp. 13 figures. E.S.

ASSOCIATIONS

BLOOMQUIST, W. C. What you should know about the TAPPI Engineering Conference. Tappi 36, no. 8: 74A, 76-7A (August, 1953).

A brief summary of the activities of the Engineering Division of TAPPI, specifically of the annual Engineering Conference, is presented. The article is directed to management, so they will know the benefits their representatives will receive, and to mill engineers, so they will know what to expect at these conferences. E.S.

CHAMPEAUX, PIERRE. L'Association Technique de l'Industrie Papetière. Papier, carton et cellulose 2, no. 3: 65-6 (July-August, 1953). [In French]

The activities of the French association (l'A.T.I.P.) with particular reference to documentation, translation service, standardization, meetings, and publications are outlined. The covers of 45 periodicals available for consultation in the reading room are reproduced. E.S.

BARKERS AND BARKING

ANON. Peeling hardwood. Tappi 36, no. 8: 100A (August, 1953).

A brief reference is made to a study at the Paul Smith Experimental Forest in the Adirondacks of New York to determine the relative ease of peeling beech (I), red maple (II), and yellow birch (III). (III) peeled most easily; (II) also peeled readily, whereas (I) was the most difficult to handle. Beech bark sets to the wood rapidly; one day in the sun dries out the cambium and cements the bark to the wood. A simple measuring rod (which employs a car-radio antenna and is easily attached to any side of a chain saw by a swiveling bracket) permits pulpwood cutters to measure bolt lengths and buck the tree into bolts in one operation. 1 table and 1 diagram. E.S.

BEATING

BRYDE, Ø., ELLEFSEN, Ø., and SMITH, T. H. Nitration as an analytical tool in the study of wood pulps. IV. The chemical composition of fiber fractions from nonbeaten and beaten fiber materials. Tappi 36, no. 8: 353-9 (August, 1953); *cf.* B.I.P.C. 21: 387-8.

The nitration procedure for studying wood pulp components has been carried out on various pulp fractions, classified according to the average fiber length. The apparent relationship between pulp properties, such as viscosity and fiber length, is discussed. The possibility that this relationship may be partly due to mixing of two components in different proportions is suggested. Similar investigations on beaten stock show that beating causes a transfer of high-molecular to lower-molecular substance. The amount of such "produced" low-molecular material is different in different grades of pulp. The degradation occurs in all fiber fractions and obviously has nothing to do with the cutting action of the beater. Nonglucosidic polysaccharides are more readily degraded than are the glucosidic. It is reasonable to assume that there is a connection between the production of low-molecular material and the papermaking properties developing during the treatment of the pulp in the beater. 1 table, 12 figures, and 21 references. E.S.

SAARNIO, JOUKO. Beating properties and polyuronide content of sulphite pulp. Paper and Timber (Finland) 35, no. 5: 217-19 (May, 1953). [In English]

The influence of the carboxyl content of bleached and unbleached spruce sulfite pulps on the water absorption and beating properties has been investigated. The amount of free carboxyls decreases during bleaching or after an alkali treatment in a nitrogen atmosphere. With increasing amounts of free and polyuronide carboxyls, the hydrophilic properties and the rate of beating of a pulp increase. Water absorptivity and rate of beating can therefore be considered a measure of the polyuronide hemicelluloses present in a pulp. 3 tables and 11 references. E.S.

BLEACHING

RICHTER, JOHAN. Present tendencies in the development of pulp bleaching. Svensk Papperstidn. 56, no. 14: 548-9 (July 31, 1953). [In English]

Recent developments in chlorine dioxide bleaching, alkali refining, stock consistencies, equipment (pulp washing in particular), and multistage bleaching are reviewed briefly. The need for a reduction of the number of stages in multistage bleaching and for units of similar design but capable of handling different bleaching operations is pointed out in the interest of reduced cost of first installation, power consumption, and maintenance. E.S.

BOARD—CONVERSION

GUT, H. Errors and conversion problems in boxmaking. Allgem. Papier-Rundschau no. 10: 429-31 (May 20, 1953). [In German]

The author shows how complete specifications, correct planning of the sequence of the different conversion stages, and good maintenance of the conversion machinery will avoid the delivery of incorrect or defective goods and their rejection by the buyer. 1 table. E.S.

KLINGELHÖFFER, HANS. The technology of scoring of board. Allgem. Papier-Rundschau no. 5: 208-11 (March 5, 1953). [In German]

In all cutting and scoring processes during board conversion the quality of the resulting products depends equally upon the properties of the board and the technical conditions of the converting machinery. The depth of the score line (I) depends not only upon the effective cutting width of the score rule, but also upon the elasticity of the board; the latter differs in the machine and cross-machine direction. The different scoring stages of a triplex carton include: (1) a compression of the fibers at the point of contact between score rule and top liner, (2) the entrance of the score rule into the upper fibrous layers, and (3) the tear-through of the lower fibrous layers of the filler. A brittle board does not permit deep scoring because otherwise stage (3) may take place too early. An elastic board exhibits a pronounced spring-back so that it is difficult to maintain a definite (I). An instrument for detecting irregularities in (I) has been developed and is described. The difference on bending of scored and creased boards is illustrated in photomicrographs. The stresses exerted on the score lines and their relationship to bursting strength and tear are discussed. 4 diagrams and 4 photomicrographs. E.S.

BOARD—EXPANSION AND CONTRACTION

UPSON, JAMES J. New Upson process for dimensional stabilization of cellulose materials. Paper Trade J. 137, no. 6: 14-16 (Aug. 7, 1953); *cf.* B.I.P.C. 23: 623-4.

The efficient stabilization of cellulosic materials (board, printing papers, photographic paper, index cards, drawing and recording paper, etc.) with glycol dicarboxylic acid monoesters, polyhydric alcohols, and polycarboxylic acids as disclosed in the U. S. patents 2,629,648, 2,629,674, and 2,629,701 granted to Walter P. Ericks (Feb. 24, 1953; *cf.* B.I.P.C. 23: 594-5) is discussed. 1 illustration. E.S.

BOARD, CORRUGATED

ANON. Corrugated board and corrugated containers. Wochbl. Papierfabrik. 81, no. 5: 153-4 (March 15, 1953). [In German]

The manufacture and types of corrugated board, machinery employed, conversion to containers of different size and shape, and testing procedures are reviewed briefly. E.S.

BOARD MILLS

ANON. Flintkote expands West Coast operations. Fibre Containers 38, no. 6: 55, 57-8, 61 (June, 1953); *cf.* B.I.P.C. 23: 788.

A similar description of the new Flintkote board mill at San Leandro, Calif. is given as in the preceding reference. 12 illustrations. E.S.

ROBERT GAIR COMPANY, INCORPORATED. Robert Gair. Tappi 36, no. 8: 102-5A (August, 1953).

The different divisions of the Gair Co. in the United States and of Gair Co. Canada Ltd., a total of 37 divisions, are described briefly. E.S.

PAPIER, CARTON ET CELLULOSE. A visit to the Cartonneries de la Rochette. Papier, carton et cellulose 2, no. 3: 48-51 (July-August, 1953). [In French]

An illustrated description of the French board mill at Laneuveville near

Nancy with a daily production of approximately 120 tons of different grades of board (from chipboard to bleached fine boards) is given. The installations include two Hydrapulpers and a Banning & Seybold seven-cylinder board machine. 9 illustrations. E.S.

BOARD SPECIALTIES

NATIONAL CONTAINER CORPORATION, *Jacksonville, Fla.* Corrugated separators reduce freight damage to melons. Boxboard Containers 71, no. 728: 51 (August, 1953).

Corrugated kraft-paper Safe-Load melon separators made at the Jacksonville plant of the National Container Corp. consist of scored corrugated strips placed between the ends of melons when they are packed on railroad freight cars. The separators are claimed to show a decrease of approximately 90% in the normal freight-damage rate for watermelons. 1 illustration. R.A.S.

BOARD TESTING—CHEMICAL

JENNINGS, EDW. C., JR., and EDWARDS, DAVID G. Determination of methoxychlor on insecticide-treated paperboard by ultraviolet spectrophotometry. Anal. Chem. 25, no. 8: 1179-82 (August, 1953).

A direct ultraviolet spectrophotometric method for the determination of methoxychlor on treated paperboard has been developed using the 230 mμ absorption maximum. The methoxychlor was extracted from the paperboard with cyclohexane and compared with a blank extraction, and the correction for background interference was made by calculation by the double impurity index method. A precision of ±5% was obtained for the determination of methoxychlor in cyclohexane solution in the presence of board background, and recoveries of 92.6 ±2.2% from paperboard were obtained. 2 tables, 2 figures, and 11 references. E.S.

BOARD TESTING—PHYSICAL

ECKHART, CLYDE, and BURNETT, L. K. Numerical evaluation of printability of paperboard. Tappi 36, no. 8: 369-71 (August, 1953).

Parts of two published methods for determining printability of paper and paperboard have been combined to secure a numerical evaluation of paperboard printability (*cf.* Berberich and co-workers, B.I.P.C. 18: 35, and Diehm, B.I.P.C. 20: 514). Unknown paperboard samples are compared with a standard sample by simultaneous printing from a graduated halftone electrotype. Ink coverage is determined by brightness measurements. Fidelity of image reproduction is measured by a visual comparison with ideal printing standards. A combination of these values yields a numerical evaluation of printability. By this method, the mill learns of variations within a run and from run to run, whereas the carton printer learns what to expect from each run of board. Results show only limited correlation with physical tests. 7 figures and 3 references. E.S.

KERR, W. RAYMOND. The Kerr Definometer: an instrument designed to evaluate the sharpness of image gloss of decorative wallboard. ASTM Bull. no. 191: 54-7 (July, 1953).

An instrument has been devised to measure the image definition of glossy finishes on such material as decorative wallboard. This evaluation is made by measuring the sharpness of image gloss of the surface in terms of a standard graduated chart used to produce a reflected image under definite conditions. The instrument is simple to construct and operate. Close checks

on identical material are possible between observers. The instrument may also be used for other glossy industrial finishes. 2 tables, 7 figures, and 5 footnotes. E.S.

BORAX

BORAX CONSOLIDATED, LIMITED, *London*. Boron products in the paper and board industry. World's Paper Trade Rev. 139, no. 20: 1483-4 (May 14, 1953); *cf.* B.I.P.C. 22: 317.

Applications of borax and boric acid as a straw preservative, buffer agent, casein solvent, flameproofing agent, corrosion inhibitor, mildew preventive in libraries, etc. are described briefly. Both chemicals are available in granular and powder form. The company's trade-marked product Neobor, a more concentrated form than ordinary borax, permits economies in storage space and handling and labor costs. 8 references. E.S.

CELLULOSE

KRÄSSIG, H. Macromolecular compounds. [377] Cellulose. [110] The action of hexamethylene diisocyanate on benzene-included rayon. Makromol. Chem. 10, no. 1: 1-12 (June, 1953). [In German; French summary] *cf.* B.I.P.C. 23: 544.

Rayon cellulose was dried by solvent exchange with acetone and benzene, and the benzene in the "benzene-wet" benzene-included cellulose was replaced by benzene solutions of hexamethylene diisocyanate. After treatment, the material contains up to 3.5% nitrogen corresponding to one hexamethylene diurethane/four glucose units. The presence of such a cross linkage is indicated by a 50% reduction in swelling and by insolubility in cuprammonium hydroxide. The nitrogen is not removed by washing. That the nitrogen is not present as diureas or polymeric ureas or urethanes is shown by the insolubility in 85% formic acid and by the properties of the residue obtained by degrading a sample with potassium bisulfate and extracting with 10% sodium hydroxide. 7 tables and 8 references. K.W., Jr.

ZAPF, F. Macromolecular compounds. [380] Cellulose. [112] Kapok cellulose. Makromol. Chem. 10, no. 1: 71-7 (June, 1953). [In German; English summary] *cf.* B.I.P.C. 24: 12.

The composition of the kapok fiber (a seed hair) resembles wood rather than cotton. Even the molecular chain-length distribution of its cellulose (determined by fractional precipitation of the nitrates from carefully isolated cellulose) is more similar to that from wood. The high K_m values of dilute solutions of the nitrates are attributed to nonuniformity with regard to molecular size. 3 tables, 1 figure, and 9 footnotes. K.W.,Jr.

CELLULOSE—DEGRADATION

KLEINERT, THEODOR, and MÖSSMER, VIKTOR. Heterogeneous degradation of cellulose. III. Mild oxidative degradation of cotton by means of sodium toluenesulfonyl chloramide. Monatsh. Chem. 84, no. 3: 641-4 (June 15, 1953). [In German] *cf.* B.I.P.C. 20: 632-3.

The degradation of cotton cellulose by oxidation with sodium toluenesulfonyl chloramide is much slower than that of rayon cellulose. The plot of D.P. of residue against time is similar to that of rayon in slope, but levels off at a D.P. of 600-650. Four atoms of oxygen correspond to each breakage of the chain. 1 table, 1 figure, and 4 references. K.W.,Jr.

CELLULOSE—OXYCELLULOSE

MELLER, ALEXANDER. Reduction of chemically modified cellulose by sodium borohydride. Tappi 36, no. 8: 366-7 (August, 1953).

Previous studies by the author (*cf.* B.I.P.C. *22*: 484) indicated that the hot-alkali sensitivity (I) of acid-degraded celluloses is predominantly influenced by the presence of carbonyl groups (hemiacetal end groups). It was anticipated that by a reduction of the terminal aldehyde (hemiacetal) group of the end units of acid-degraded cellulose to an alcoholic group its (I) will decrease. The results of preliminary experiments involving the reduction of hydrocellulose samples with sodium borohydride solution confirmed these expectations; the reduction of a wet sample (which had not been previously dried) seemed to be more extensive than that of the dried sample. It was also anticipated that the reduction of the aldonic acid groups (or lactone) present in gluconic acid oxycelluloses may either proceed as far as the aldehydic or the alcoholic stage; whereas the former would result in an increased (I), the latter would have the opposite effect. Data are given which show that—in a qualitative sense at least—these expectations have been fulfilled. The studies are being continued and a complete report will be issued at a later date. 2 tables and 4 references. E.S.

CELLULOSE—REACTIVITY

TIMELL, T. E. Studies on carboxymethylcelluloses. V. The relative reactivity of the hydroxyl groups of cellulose. Svensk Papperstidn. 56, no. 13: 483-90 (July 15, 1953). [In English; German and Swedish summaries] *cf.* B.I.P.C. 23: 795-6.

Following a short survey of the factors which determine the relative reactivity of the three hydroxyl groups in cellulose, a review is given of the current literature on the subject. It is concluded that the 6-hydroxyl group is in general the most reactive, although under certain conditions, the preferential conversion of the 2-hydroxyl groups is favored; the group in the third position has always been found to be the least reactive. The relative reactivity of the primary and secondary hydroxyl groups during carboxymethylation was studied by analyzing a series of 10 different low-substituted carboxymethylcelluloses, as well as the water-soluble fraction of each. Disregarding the first sample (which could not be studied accurately), the primary hydroxyl group was found throughout to be approximately twice as reactive as the average of each of the secondary ones. These relative reactivities remained constant almost from the beginning of the reaction until a D.S. of at least 0.72 had been reached. These results render the conclusions drawn in an earlier study with regard to the preferential conversion of the primary hydroxyl group during the initial stages of carboxymethylation rather doubtful. A comparison of the values obtained by application of the periodate-formaldehyde method with those found by periodate oxidation of the fibrous material suggested that overoxidation must have taken place in the second case. This factor probably accounts for the low content of secondary hydroxyl groups found by previous investigators. The hydroxyl groups of cellulose apparently behave differently toward different reagents and under different external conditions; general statements regarding relative reactivities based on experimental data obtained for only one type of conversion under certain specific conditions should therefore be avoided. 9 tables and 51 references. E.S.

CELLULOSE ESTERS

COX, LIONEL A., and MOHNEY, WILLIAM K. Filterability of cellulose acetate solutions. Ind. Eng. Chem. 45, no. 8: 1798-803 (August, 1953).

A practical constant-rate filtration method has been developed for determining the filtering behavior of high polymers. When pressure-time data, obtained for cellulose acetates in an acetone-water solvent, are plotted on semilogarithmic paper, linear relationships are obtained for the major portion of the filtration curve in most cases. Thus, the filtering behavior of cellulose acetates may be described in terms of an intercept, P_o, and a slope, K. Under arbitrarily established standard conditions of filtration, P_o, the extrapolated starting pressure is mainly controlled by the viscosity of the solution. Under the same standard conditions, K, the filter behavior of the polymer is affected mainly by nonuniformities in the solution, such as fiber fragments, fiber gels, gels, insoluble salts, and dirt. The K values may be combined arithmetically. The reciprocal of K is shown to be F, the relative filter life expectancy of a filter press. The K and/or F values are shown conclusively to be essentially independent of P_o and the viscosity of the solution. This permits direct comparison of test results of cellulose acetate solutions of different viscosities. This filtration method was used in studying the manufacture of cellulose acetate flakes. For example, filtering behavior of the flakes is affected by the type of pulp, pretreatment, acetylation conditions, and the presence of noncellulosic impurities. 9 tables, 5 figures, and 21 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

SCHERER, PHILIP C., and JOHNSON, JAMES E. Mechanical properties of high polymers. VI. A study of the shape factor. Modern Textiles 34, no. 6: 51-2, 80; no. 8: 63, 66, 72, 105 (June, August, 1953); *cf.* B.I.P.C. 21: 158.

The authors postulate that the molecular chain-length distribution curve for cellulose nitrate may be defined by three factors: (1) the D.P. at the maximum height of the differential distribution curve, (2) the height at that point, and (3) the extent of skew. These three factors may be combined to a shape factor (shape of the distribution curve) which correlates mechanical properties of the polymer films. 7 tables, 7 figures, and 2 references. K.W.,Jr.

ZAPF, F. Macromolecular compounds. [379] Cellulose. [111] The viscosity of nitrated wood celluloses. Makromol. Chem. 10, no. 1: 35-70 (June, 1953). [In German; English summary] *cf.* B.I.P.C. 24: 10.

Although the nitrates of wood cellulose have abnormally high K_m values, the K_m values of fractionated material (from acetone) are comparable to those of fractionated nitrated cotton. In the mass-distribution curve of a nitrated pine cellulose, three maxima were determined; the possibility is considered that these may represent different molecular weights for different types of wood cells. The K_m values of the nitrates of wood cellulose reprecipitated from cuprammonium solution are only slightly lower than those from the original cellulose. About 6.5% of the wood cellulose is not precipitated from cuprammonium solution by sodium potassium tartrate. This portion consists of wood polyoses (pentosan content 79%, uronic acid content 8-13%, methoxyl content 0.5%). The fractionation of the nitrate from precipitated wood cellulose is much easier because of the removal of this material. Viscometric studies with technical cellulose nitrates indicate that the presence of foreign groups or compounds does not substantially affect the viscosity of dilute solutions of cellulose nitrates. Those of difficult solubility and heteropolar nature increase the viscosity of concentrated solutions, an effect which can be minimized by increasing the shearing stress. Cellulose nitrate in acetone solution is rapidly degraded by ethereal solutions of di-

azomethane. The mechanism of this breakdown is not known. 20 tables, 12 figures, and 44 footnotes. K.W.,Jr.

CELLULOSE FILMS, TRANSPARENT

AMERICAN PAPER CONVERTER. Cellulose acetate . . . development and applications. Am. Paper Converter 27, no. 8: 13-17 (August, 1953).

Cellulose acetate, of which the total output for packaging purposes is approximately 15 million pounds a year, is reviewed; physical properties and characteristics, method of production, cost and yield, printing characteristics, methods of testing (waterproofness, greaseproofness, nonfogging, dimensional stability, and solvent sealing), sealing, and applications are covered. 2 tables, 5 illustrations, and 2 references. R.A.S.

CHEMICAL TESTING—CARBOHYDRATES

LUNT, E., and SUTCLIFFE, D. A new colorimetric reagent for carbohydrates. Biochem. J. 55, no. 1: 122-6 (August, 1953).

The use of a new colorimetric reagent, resorcinol-4,6-disulfonic acid, for the determination of hexoses and their polysaccharides is described. The reagent has been used chiefly for the determination of glucose, fructose, and their polysaccharides. From 10 to 250 μg. of glucose in 5 ml. may be determined with errors of less than 1%. Inulin and starch give 100% and dextran 95% of the color intensity given by their constituent monosaccharides. 5 figures and 9 references. E.S.

CHEMICAL TESTING—CELLULOSE—ACCESSIBILITY

BORGIN, GERD L., NICOLAYSEN, V. B., and PEDERSEN, NILS. Sorption of formic acid to various celluloses. Norsk Skogind. 7, no. 6: 198-201 (June, 1953). [In English; Norwegian summary]

The accessibility of cellulose to formic acid was measured by a modified Nickerson method (*cf.* B.I.P.C. 21: 617). The difference between the accessibilities of several pulps of acetylating grade, as well as the difference between acetate and rayon-grade pulps was found to be too small to show up in this method. There was, however, a distinct difference in formic acid sorption by different cellulose fibers, such as cotton linters, and cotton, flax, sisal, jute, and coconut fibers. It was also possible to use the formic acid sorption to follow the changes in the morphological structure of cellulose which take place during the transformation from cellulose I to cellulose II during mercerization and from cellulose II to cellulose T on heating in glycerol. The increased orientation in viscose rayon by increased stretch during spinning caused a gradual decrease in the amount of bound formic acid. The linkage between cellulose and formic acid is assumed to consist of hydrogen bonds formed between unsaturated hydroxyl groups (for instance those lying on the outside of the crystalline regions) and the formic acid in solution. 3 tables, 4 diagrams, and 9 references. E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

KROUPA, ROBERT. Contribution to the rapid method for determining the cuprammonium viscosity of pulps. Wochbl. Papierfabrik. 81, no. 6: 187-9 (March 31, 1953). [In German]

Suggestions for improving the apparatus employed in the German standard method IV/30 involve the use of a portable thermostat for maintaining a

uniform temperature of 20°C. throughout the test; an improved viscometer, a combination of the Ostwald and Ubbelohde model; a shaking device for the rapid solution of the cellulose in cuprammonium; the replacement of the fragile brown glass bottles in which solution takes place with plastic (Vinidur) containers; and a device for the rapid dewatering and drying of wet pulp. 4 figures and 3 footnotes. E.S.

CHLORINE DIOXIDE

HEITMAN, JOSEPH B. Chlorine dioxide generation by reducing sodium chlorate with sulfur dioxide. Pulp & Paper 27, no. 7: 72, 74, 77 (July, 1953); Tappi 36, no. 9: 419-23 (September, 1953).

A description of a pilot-plant chlorine dioxide generator of the Griesheim type consisting of three vertical-type reactors is presented, in which sulfur dioxide is used as a reducing agent for sodium chlorate in strong sulfuric acid. Design features, materials of construction, and operating characteristics are covered. The use of a generator of this type is believed to offer advantages over other processes for the commercial production of chlorine dioxide because of the relatively low acid requirement, improved chlorate efficiency, and the simplicity and ease of control of the generating equipment. An additional advantage is the fact that the sulfur dioxide used as a reducing agent either reacts instantaneously or remains in the gas phase and does not build up an appreciable dangerous concentration in the reactors. During the tests of the pilot-plant generator solid sodium chlorate and dilute acid were added to the reactor, according to German practice; a more advantageous operation on a commercial scale might result from the addition of strong acid to a concentrated chlorate solution in the reactor. This would make possible the storage and handling of sodium chlorate as a solution which could be easily pumped to the reactors. The sodium chlorate could be dissolved from tank cars by warm water and held in a storage tank in solution until required. An attempt is made to explain the anomaly of the material-balance efficiency being greater than the theoretical amount indicated by the chlorine dioxide-chlorine ratio. The possibility that some chlorine monoxide is produced as a side reaction is listed as an explanation. 1 table, 1 flowsheet, 1 figure, and 8 references. E.S.

CHROMATOGRAPHY

TRAYNARD, PH., and EYMERY, A. Paper chromatography. Papier, carton et cellulose 2, no. 3: 67-70, 73-4 (July-August, 1953). [In French]

Different applications of paper chromatography are reviewed. 1 table, 5 figures, and 8 references. E.S.

CLAY

LEWIS, D. R. Replacement of cations of clay by ion exchange resins. Ind. Eng. Chem. 45, no. 8: 1782-3 (August, 1953).

Specific single ion forms of clays are needed for obtaining desired physical properties of clays for industry as well as for fundamental investigations. By flowing suspensions of Wyoming bentonite through ion-exchange resin beds, this clay was converted to the calcium, magnesium, ammonium, and hydrogen forms. The effects of flow rate, clay suspension, concentration, and amount of accompanying electrolyte on the extent of conversion of the clay to these ion forms were investigated. It was found that the complete conversion to the hydrogen form was much more rapid than for the other ions. These data provide an outline of operating conditions to permit any degree of conversion of clay to a desired ion form. 5 tables, 1 figure, and 2 references. E.S.

COLOR

EBHARDT, HERMANN. The effect of ruling dyes upon the human eye. Allgem. Papier-Rundschau no. 10: 420-2 (May 20, 1953). [In German]

Experiments for studying fatigue in bookkeepers when working with ruled accounting books (surface and color of paper and color of ruling) led to the adoption of a light-green mat paper, printed with green and soft brown or delicate red ruling in a number of countries. In continuation of these experiments, papers in many different shades were printed with different ruling dyes and submitted to a number of bookkeepers (who were not in contact with each other) for preferential selection. This test gave a surprising result. One series of samples had been printed with one-color ruling; the bookkeepers selected the one-color ruling (purple gray) on a light-yellow paper shade as the least tiring of all. The test was repeated with a nonprofessional group, and a similar selection resulted. The influence of the type of artificial illumination upon color selection is also considered. The physiological and optical reasons for the above selections are explained. E.S.

COLOR-BLINDNESS

PAGE, ANDRÉ. Colour and visibility, with a note on the detection of colour blindness. Brit. Printer 66, no. 391: 71-2 (July-August, 1953).

The author discusses visibility of color with regard to simultaneous and successive contrast, light source, isolation, and color combinations and describes briefly three generally used color-blindness tests (the Edridge-Green bead test, the Holmgren thread test, and the Japanese color-chart test). E.S.

COLORIMETRY

INSTRUMENT DEVELOPMENT LABORATORIES, INCORPORATED, *Needham Heights, Mass.*, and Van den Akker, J. A. Photoelectric instruments for measurements of color. Tappi 36, no. 8: 119-26A (August, 1953).

In the first part of the polemic, the manufacturer of the "Color-Eye," which was covered in Instrumentation studies LXXVI of The Institute of Paper Chemistry (*cf.* B.I.P.C. 23: 244), criticizes the report on several accounts. In the second part a reply of the senior author of the original report is given. 1 table, 2 figures, and 11 references. E.S.

CONTAINER INDUSTRY—EDUCATION

MICHIGAN STATE COLLEGE, *East Lansing, Mich.* An opportunity to invest in future of packaging is offered by college. Packaging Parade 21, no. 247: 87, 89-90 (August, 1953).

Michigan State College has announced the inauguration of a 4-year course of study leading to the degree of bachelor of science in packaging technology. The course includes a general program for the first two years, with an introduction to packaging, and a highly diversified program for the final two years, including such courses as industrial packaging, package cost analysis, packaging materials, consumer packaging, and related subjects. Equipment needs of the laboratory are listed with a request to suppliers to furnish the necessary items. R.A.S.

CORNSTALKS

CLARK, T. F., and ASHBROOK, J. W. Why the emphasis on corn cobs. Chemurgic Dig. 12, no. 6-7: 9-10 (June-July, 1953).

Supply and availability, chemical and physical characteristics, agricultural uses (poultry litter, mulch, feed for beef cattle, and flour used in the preparation of insecticides), industrial uses (in finishing operations such as deburring, flash-removal, burnishing, cleaning, drying, and polishing by tumbling; as abrasives; in the manufacture of dynamite cartridges and cement; for cleaning and dressing furs; and in the manufacture of rubber products and furfural), and industrial processing of corncobs are given. 1 table. R.A.S.

CORROSION

FOULON, A. Protection against corrosion through plastics. Wochbl. Papierfabrik. 81, no. 5: 156-7 (March 15, 1953). [In German]

The use of plastic linings for machinery sections, piping, containers, etc. is described. E.S.

TEEPLE, H. O. Appraisal of alkaline digester corrosion problems. Southern Pulp Paper Mfr. 16, no. 8: 62-4, 66, (August, 1953); Paper Mill News 76, no. 34: 64-6, 68 (Aug. 26, 1953); *cf.* B.I.P.C. 23: 324.

The author reviews the work done in the United States, Canada, Sweden, and Australia on the problem of alkaline digester corrosion, results obtained to date, and future approaches to secure a satisfactory solution. 10 references. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 12. Pricing principles and practices. Boxboard Containers 71, no. 728: 23-5, 69 (August, 1953); *cf.* B.I.P.C. 23: 880.

Cost information, determined by methods described in the author's previous articles by formula, is plotted on an annual profit graph. Figures determined from the sales of the same year form another line on the same graph. The point of intersection of the lines is the break-even point; above this amount is the profit zone and below it the loss zone. Allowing for a base profit representing the normal rate of profit on sales to which the business is entitled, the profit zone should balance the loss zone. This information should readily show the businessman when he can safely reduce prices to meet those of a competitor without endangering his own business balance. 3 illustrations of profit graphs. R.A.S.

COTTON LINTERS

THODE, E. F., HANGAL, P. S., and LEWIS, JOHN. Effect of bleaching treatments on the physical properties of cotton linters pulp. Paper Trade J. 137, no. 1: 16-18 (July 3, 1953).

Cotton-linters pulp prepared by a caustic cook and by an alkaline sulfite semichemical cook were bleached with both sodium hypochlorite and calcium hypochlorite solutions and subsequently superbleached with sodium peracetate solution. Brightness, cupriethylenediamine viscosity (I), and beater test data are reported. Both the caustic-cooked and semichemical-cooked linters bleached to a brightness value of 88 by use of 1.5% calcium hypochlorite followed by 2% sodium peracetate (as peroxide). However, the semichemical pulp required only 1% hypochlorite prior to peracetate treatment to attain

this final brightness. In addition to being an easier-bleaching pulp than the caustic pulp, the semichemical pulp showed less degradation, in both the unbleached and bleached states. Sodium hypochlorite bleach produced excessive degradation of both pulps as displayed by low (I) and poor physical tests. A correlation of burst factor with (I) for pulps beaten 105 minutes showed a good linear relationship. 4 tables, 2 figures, and 3 references. E.S.

DIGESTERS

HOPPER, EDWARD W. Some observations on the causes and prevention of kraft digester corrosion. Tappi 36, no. 8: 345-52 (August, 1953).

Carbon-steel kraft digesters generally gave good service life up to 1934-35. Since that time, undetermined changes have been made which cut the life to as little as one to two years. This shortened life may be due to one or more factors or changes in the digester proper or in the pulping operation. The author outlines the variables in the steel, liquor, and circulation which may influence corrosive or erosive attack. Results of chemical, spectroscopic, and microscopic examination of digester steel samples are included. A method used in increasing the life of seriously thinned digesters is described. There apparently is no clean-cut cure-all for the excessive corrosive attack. There are probably other contributing factors and better methods for controlling attack. The article attempts to emphasize the scope and ramifications of this expensive problem and to stimulate thought along all lines that may contribute to decreasing the rate of corrosive and erosive attack. 2 tables, 5 figures, and 1 reference. E.S.

DISINFECTION AND DISINFECTANTS

HELWIG, HELLMUTH. Books infected by mold; possibilities for disinfection and preservation. Das Papier 7, no. 13/14: 235-9 (July, 1953). [In German; English and French summaries]

Books infected by molds (especially *Trichothecium roseum*) may be endangered because of cellulose decomposition. Five physical and chemical methods of disinfection are described, but none of these is satisfactory, largely because of high labor and materials costs, nor do they insure fully against subsequent reinfection. The importance of devising new techniques is emphasized. 1 table and 19 references. L.E.W.

DRYING

HOT OIL HEATER COMPANY, INC., *Newtonville, Mass.* Drying with hot oil. Fibre Containers 38, no. 7: 52, 54, 56, 58 (July, 1953).

The company has recently introduced a new heater system which transfers heat through a mineral heat-transfer oil which is circulated at atmospheric pressure. The fundamentals, operation, and maintenance of the system are described, as well as the possibilities of its application to corrugators, paper and board drier rolls, drums of printing presses, and coating machinery. 3 figures. E.S.

DRYING—PAPER

ANON. The drying of paper; its influence upon shrinkage and strength. Papier, carton et cellulose 2, no. 3: 75-6, 79-80 (July-August, 1953). [In French]

Brief summaries of the pertinent work of Stamm, Renaud, Weidner, Lyne and Gallay, Sapp and Gillespie, and Arlov and Ivarson on the subject are presented. 5 tables, 7 diagrams, and 6 references. E.S.

BIENKIEWICZ, B., and MARDON, J. Some observations on drying on Yankee type cylinders. Paper-Maker (London) 124, Annual no.: 32-6, 38, 40-3, 46 (1952).

Observations of the pressing action of a Yankee-cylinder pressure roll indicate that a single roll may remove up to 40-50% of the moisture present in a tissue paper, lowering the moisture content from approximately 2.8 lb./lb. of dry paper to 1.5 lb./lb. of dry paper. A method is given for constructing material and heat balances from air measurements in the vapor-absorption plant, and is illustrated by data obtained on three different machines. In some cases, it is possible to estimate the conditions of spent supply air before it mixes with the outside air leaking in. In such cases, a very approximate estimate of the temperature of the wet surface of paper is given, and the corresponding mass and heat transfer coefficients are calculated. For the air film at the surface of the paper, these amount to some 100 lb. of vapor/(hour)(sq. ft.)(lb./lb. of dry air) and B.t.u./(hour)(sq. ft.)(°F.), i.e., are some five times larger than would be expected if no jets were used. The heat transfer coefficients through the paper could not be determined in all cases, because of the difficulty of measuring the surface temperature of the cylinder. A preliminary estimate is that the resistance to heat flow from air to paper is some five times as large, as from the inside of the cylinder. 8 tables, 4 figures, and 14 references. E.S.

BIENKIEWICZ, B., and MARDON, J. Some observations on drying on Yankee type cylinders. Part II. Paper-Maker (London) 126, no. 1: 30-2 (July, 1953).

Material and heat balances, the construction of which was described in Part I, were used to determine the optimum operating conditions of the drying air system of an M.G. cylinder. This was obtained as a balance between the saving of steam produced by closing the exhaust against adverse effects peculiar to the machine, i.e., condensation inside the hood, and ventilation of space outside it. A comparison of the effect of air humidity on the drying rate on two other machines suggests that increased humidity slows down drying appreciably at relatively low temperatures, but is of no importance at higher temperatures. In contrast, the effect of air temperature itself is noticeable in both cases. Values of heat and mass-transfer coefficients involved in drying and of the temperatures of the surface of drying paper, as estimated by a method described in Part I, are presented. 3 tables and 2 diagrams. E.S.

DYES AND DYEING

JÖRG, O. Beater dyeing. Wochbl. Papierfabrik. 81, no. 4: 119-20 (Feb. 28, 1953). [In German]

The difficulties involved in color matching, the training of responsible personnel, and the need for testing and screening applicants are discussed briefly. E.S.

ENZYMES

REESE, ELWYN T., and GILLIGAN, WILLIAM. Separation of components of cellulolytic systems by paper chromatography. Arch. Biochem. and Biophys. 45, no. 1: 74-82 (July, 1953).

It has been demonstrated by paper chromatography that filtrates of cellulolytic organisms contain up to three cellulolytic (Cx) components, depending on the species and on the conditions of growth. The cellulolytic components may also be separated by differential adsorption on cellulose and kaolin. The several components may represent multiple enzymes, or may be

caused by the interactions of a single enzyme with other elements in the system. 7 figures and 7 references. E.S.

EVAPORATION AND EVAPORATORS

WEISMAN, WILLIAM I. Submerged combustion evaporation. Tappi 36, no. 8: 383-4 (August, 1953).

Submerged combustion is defined as "burning a gaseous fuel in a special burner submerged completely beneath the surface of a liquid." The components and functioning of a submerged-combustion evaporator are described. The advantages of this method are a result of the direct transfer of heat from the products of combustion to solution. It is particularly applicable to solutions with sealing characteristics, high viscosity, high boiling points, or corrosiveness. Limitations arise from the necessity of using gaseous fuel or relatively expensive oil and the inability to perform as a multiple effect. Possible uses in the pulp and paper industry are in mills with insufficient steam-generating capacity and in waste-disposal problems. For the evaporation of black liquor, submerged combustion may have merit for reaching high concentrations of solids after preconcentration by conventional multiple effects. It is suggested that pilot-plant work on this application may be of value. 1 figure and 3 references. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

JENNESS, L. C., DURST, R. E., and THODE, E. F. The evaporation and recovery of ammonia-base waste sulphite liquor. Tappi 36, no. 8: 337-42 (August, 1953).

Heat—transfer coefficients to ammonia-base spent sulfite liquor in an experimental, vertical, long-tube, forced-circulation evaporator have been determined. Variable velocities of liquor in the tubes and an approximately constant-temperature driving force were employed. The concentrations ranged from 15 to 40% solids. The evaporator consisted of an 8-inch diameter steam chest surrounding three tubes 1.5 inches in diameter and 24 feet long, surmounted by a vapor space. Liquor was recirculated from the vapor space to the tubes by means of a pump, and water vapor was condensed in a spray condenser. Over-all heat transfer coefficients varied from about 150 to 300 B.t.u./hour, sq. ft., and °F. as the solids content of the liquor varied from 15 to 40% and as the linear velocity of liquor in the tubes varied from 1 to 5 f.p.s. Within the range of this investigation the size of the coefficient was directly proportional to the apparent velocity within the tubes and inversely proportional to the concentration of the solids. The recovery of ammonia has been determined experimentally by the evaporation of mixtures of ammonia-base spent sulfite liquor and kraft spent liquor. The liquors were mixed in ratios of 1:1, 2:1, and 4:1 of kraft liquor to sulfite liquor previous to evaporation. The percentage of available ammonia recovered in the condensate from a surface condenser was found to vary from 60% to virtually complete recovery. No objectionable precipitation of solids or fouling of the tubes was observed. Serious pit corrosion of the stainless-steel vapor space, particularly where clad to mild steel, was experienced during the evaporation of sulfite liquor alone. 2 tables, 5 figures, and 8 references. E.S.

FIBER—IDENTIFICATION

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fiber analysis of paper and paperboard. Tappi 36, no. 8: 170-8A (August, 1953); *cf.* B.I.P.C. 12: 397.

This is a revision of TAPPI Tentative Standard T 401 m-42 for the identification of the kinds of fibers present in a sample of paper or paperboard and their quantitative estimation. Apparatus and materials, the disintegration of the sample, the preparation of slides, stains ("C" stain, and Herzberg, Selleger, Wilson, and Alexander stains), weight factors, morphological characteristics, the preparation of stains, special stains, and a color chart for iodine stains are covered. 2 tables and 20 references. E.S.

FIBER—STRUCTURE

ZAHN, HELMUT. Chemistry and fine structure of textile fibers. Parts I-III. Chem.-Ztg. 77, no. 1: 8-12; no. 10: 313-16; no. 11: 352-6 (Jan. 10, May 20, June 10, 1953). [In German]

The relationship of the chemical constitution, fine structure, and technological properties of a number of native and textile fibers is reviewed. References are listed in the text. 7 tables and 32 figures. E.S.

FOLDING BOXES

ANON. Bakers cite need for standardization. Am. Boxmaker 42, no. 8: 11-13, 40 (August, 1953).

The need for standardized packages of uniform size and shape in the baked-goods industry is stressed. The principal types of bakery packages in use today include the one-piece collapsible box; trays, generally used with cellophane or a waxed-paper overwrap; folding cartons of sulfite or newsprint board for packaging cookies or crackers; and the circles or U-boards for placing under cake and baked goods. The main block to achieving the desire of the industry, a nonabsorbent, odorless board in a wide range of package types and sizes, is cost, which must be minimized because the perishable nature of the product causes high production and distribution costs. 1 table and 1 illustration. R.A.S.

FORESTS AND FORESTRY

ANON. Criticisms of Paley report. Pulp & Paper 27, no. 7: 66, 93 (July, 1953).

The Paley report has been criticized in some quarters as being unjustifiably pessimistic in its over-all conclusions; the critics contend that it falls short of what it was intended to be—a reliable beacon on which forest-using industries could set their course with reasonable certainty that tomorrow's supply of raw materials was not being jeopardized. The need for a dependable inventory of the country's forest resources is being emphasized by industry leaders in the United States and Canada. Excerpts from several speeches of R. M. Fowler are included, in which he stresses the need for conservation of certain tree species for products for which they are specially suited and for co-operation of the United States and Canada in long-range forestry problems. 2 diagrams. E.S.

FLATT, F. L. [Chairman] Industry experimental forests. Pulp Paper Mag. Can. 54, no. 8: 140-2, 145-6, 149-50, 152, 154-5, 157-8, 161, 163 (July, 1953).

The discussion of the nine-member panel at the annual meeting of the Woodlands Section of the Canadian Pulp and Paper Association is presented under the headings: experimental cutting practices, production of wood, demonstration of good cutting practices, protection experiments, silvicultural experiments, and experimental logging methods. Comments by representatives of various companies are also included. R.A.S.

JOHNSON, VERNON E. Can grow twice as much wood. Pulp & Paper 27, no. 7: 58 (July, 1953).

Revolutionary changes in the field of forest management can result from a re-examination of present notions about cellulose and wood. The case of the Hawkesbury, Que. mill of Canadian International Paper Co. is cited as an example. The old mill which used softwoods as its raw material could no longer compete with more favorably situated modern mills, since pulpwood had to be hauled long distances. A program for manufacturing high-grade dissolving pulps from woods available in the Hawkesbury area (mixed stands with many hardwoods) and an intensive modernization of the plant saved the mill from closing. The program also encouraged tree farming throughout the area; the Harrington Forest Farm was set up to assist and educate farmers in their efforts to grow trees as a crop. E.S.

POMEROY, KENNETH B. Tree improvement and its potentialities. Paper Trade J. 137, no. 6: 18-19 (Aug. 7, 1953).

The author describes briefly the results of a decade of research on the propagation and controlled breeding of high-yield turpentine pines by the Southeastern Forest Experiment Station in Florida. He discusses the interesting possibilities for establishing a similar program for producing superior strains of pulpwood species by the combined efforts of silviculturists and geneticists. 2 figures. E.S.

GRAPHIC METHODS

PAPER CONTAINER. How squared paper helps in box and bag making. Paper Container 65, no. 4: 89, 91; no. 5: 117; no. 6: 145, 147 (October-December, 1951); 66, no. 1: 5, 7; no. 2: 33, 35; no. 3: 61, 63; no. 4: 89, 91; no. 5: 113, 115; no. 6: 137, 139 (January-June, 1952); 67, no. 1: 5; no. 2: 33; no. 3: 57; no. 4: 81, 83; no. 5: 105, 107; no. 6: 133, 135 (July-December, 1952); 68, no. 1: 5; no. 2: 33, 35; no. 3: 57, 59; no. 4: 81; no. 5: 105; no. 6: 129 (January-June, 1953); 69, no. 1: 5 (July, 1953).

Examples of different uses of squared paper for records of essential information in practical box- or bagmaking to indicate possible improvements in economy and efficiency are given. The applications include the preparation of charts for recording the output of operators and machines, stocks of raw material on hand, seasonal business fluctuations, delivery variations, and various factory requirements; for planning the layout of a factory room or plant installations; for giving directions to workers, thereby avoiding mistakes resulting from misunderstanding of verbal instructions; for keeping time records; for making comparisons of the work of individual workers; for saving work time; for estimating and setting piece rates for different processes, including machine and manual rates; for keeping office records to be used in costing and pricing procedures; and for determining labor and machine costs and profits. 28 figures. R.A.S.

GROUNDWOOD MILLS

ANON. The new groundwood mill of Osakeyhtiö Toppila. Paper and Timber (Finland) 35, no. 6: 263-4 (June, 1953); Finnish Paper and Timber 4, no. 2: 18-19 (March, 1953). [First reference in Swedish with English summary; second reference in English]

The new Finnish groundwood mill is planned for an annual capacity of 30,000 tons to be produced on two Roberts grinders. The project is carried

out in two stages, of which the first—the installation of one Roberts grinder —is nearing completion. A brief description of the installations is given. The entire output of the mill will be sold to Peter Dixon & Son Ltd. in England. 4 illustrations in the first and 2 in the second reference. E.S.

HARD WOODS

BHAT, R. V., and VIRMANI, K. C. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XIV. Chemical pulps and writing and printing papers from *Sterculia campanulata,* Wall. Indian Forester 79, no. 3: 169-75 (1953); *cf.* B.I.P.C. 23: 885.

Laboratory experiments on sulfate cooking of the wood of *Sterculia campanulata* Wall. (papita) (I) are described; easy bleaching pulps in good yields and with satisfactory strength properties were obtained under milder pulping conditions than generally used for other woods. The average fiber length of (I) pulps is 1.49 mm., which is nearly the same as that of esparto. The wood is a suitable raw material for the production of writing and printing papers; the admixture of bleached bamboo pulp results in an increase of the strength properties. The manufacture of mechanical pulp from (I) was described in Part IX of this series; *cf.* B.I.P.C. 23: 251. 3 tables, 2 references, and 2 sample sheets, one made from 100% (I) pulp and the other from a mixture of 68% (I) pulp and 32% bamboo pulp. E.S.

HISTORY

ANON. The area around Düren and the paper industry. Allgem. Papier-Rundschau no. 10: 406-8, 410, 412, 417-18 (May 20, 1953). [In German]

The history and development of the fine paper industry around Düren is described. Examples of old watermarks used in the region and a map showing the location of the paper mills along the Rur are included. 1 table, 1 map, and 8 figures. E.S.

CHARLIER, HENRI. The song of the papermakers. Papetier 7, no. 6: 28-9 (June, 1953). [In French]

The full text and music of the traditional song of the French papermakers are given. It consists of seven verses with the recurring refrain "Long live the papermaker-journeymen." E.S.

GACHET, HENRI. Old customs of the papermaker-journeymen of long ago. Papetier 7, no. 5: 51, 53 (May, 1953). [In French]

The author describes particularly the enormous quantities of food which had to be supplied by a master to his journeymen, not only on the prescribed holidays, but also during work days. If a master failed to comply with these customs, his workers deserted him immediately. A report as late as 1813 stated that most workers in paper mills were unable to continue their profession after reaching the age of 40 to 45 years; most contracted chronic pulmonary afflictions or a deforming rheumatism. The latter was due to unsanitary working conditions in a humid atmosphere and the constant immersion of the workers' arms in the vats. It was only through the introduction of the paper machine and the gradual mechanization of the papermaking process that better sanitation and the elimination of the gastronomic excesses could be brought about. 2 illustrations and a copy of their song "If the king only knew. . . ." E.S.

REVUE DES TABACS. When playing cards served as calling cards, order cards, filing cards, as a prospectus, etc. Papetier 7, no. 7: 20-1 (July, 1953). [In French]

Not long ago, a collector's catalog offered a lot of playing cards, principally of the 18th century and of different sizes and with different designs, which had all been used for purposes other than their original one. Hardly any of the front sides of these cards is in a good condition; the backs of all of them are inscribed and indicate that the cards were used as calling cards, for all kinds of messages, for jotting down thoughts or reminders, etc. This misuse of playing cards always became prominent in times of national crises and paper shortages. During the French Revolution, they even served as checks. 1 illustration. E.S.

SPAAK, GEORGE. The history of the first industrially manufactured sulphite pulp and its introduction into the paper trade market. Svensk Papperstidn. 56, no. 14: 509-16 (July 31, 1953). [In English]

An outline of the commercial-industrial situation in western Europe at the beginning of 1870 is given. The Bergvik mill where Ekman produced the first commercial sulfite pulp, technical difficulties with digester constructional materials, and Ekman's introduction of the new pulp in various European paper mills are described. 4 figures, including a portrait of Carl Daniel Ekman. E.S.

SPORHAN-KREMPEL, LORE. Early papermaking in Ravensburg. Wochbl. Papierfabrik. 81, no. 6: 196-9 (March 31, 1953). [In German]

The author presents documentary evidence from the archives of the town that certain rumors concerning the existence of paper mills in Ravensburg as early as 1312 are incorrect. The earliest paper mill was probably founded between 1393 and 1395, i.e., several years after the mill of Ulman Stromeir in Nürnberg. Although the ox head was one of the watermarks employed in Ravensburg, it was not invented there. The ox head had been used on Italian papers about 100 years earlier and was copied from cloth mills where it designated a certain cloth quality. It was also employed as a quality sign in papermaking. 4 figures and 8 references. E.S.

INSTRUMENTATION

UPSON, J. R., and JOHNSON, T. C. Instrumentation of recovery furnaces. Tappi 36, no. 8: 378-83 (August, 1953).

The justification for instrumentation is the reduction of operating costs and the maintenance of maximum efficiency of the process. The authors describe the instrumentation program developed at the Savannah plant of the Union Bag & Paper Corp. for their recovery system, dividing the applications into six groups. These are discussed under the following headings: the spent liquor process, combustion-control instrumentation, chemical recovery, boiler instruments, control of soot blowers, and fume recovery. 6 figures. E.S.

WADE, CHAS. F. Boiler house control instruments. Paper-Maker (London) 126, no. 2: 108, 110-11 (August, 1953).

The author reviews the common types of instruments applied to steam-power plant control (carbon dioxide recorders, temperature indicators, draft

gages, feed-water meters, coal meters for mechanical stokers, etc.). The use of one panel on which all instruments are mounted closely convenient to the firing position is recommended, and the need for analyzing the results of the charts is emphasized. 1 table and 3 figures. E.S.

WALTER, LEO. Future plant robotization in the paper mill . . . the use of instruments. Paper Ind. 35, no. 5: 558-60 (August, 1953).

The author discusses the history and some of the problems involved in the development of supervisory control desks or panels, with particular reference to the "Centroller," developed by British instrument makers in cooperation with the Anglo-Iranian Oil Co. Ltd. and the "Colorgraphic" panel developed by an American instrument maker. Future trends depend on the development of new continuous processes; fully automatic remote plant control in pulp and paper mills is considered possible. 3 illustrations. E.S.

INSURANCE, FIRE

ASCHAN, BERTEL. Fire causes and protection in the pulp and paper industry. Paper and Timber (Finland) 35, no. 4a: 129-34 (Special issue, April, 1953). [In Swedish; English summary]

The results of a statistical study of the different causes of fire in the Finnish pulp and paper industry by an insurance company are presented; they indicate that certain causes are specific for each branch of the industry. In the groundwood industry, ignition induced by bearing friction caused the highest percentage of damage (I), whereas lightning predominated with regard to frequency (II). In the chemical pulp industry, careless welding accounted for the highest (I) and explosions for the highest (II); in paper mills, overheated steam lines caused the highest (I) and lightning and bearing friction the highest (II). When the losses sustained by all three groups were compared with the insured amount, it was found that the chemical pulp industry had the best record, the groundwood mills came next, and the paper mills showed the highest losses. A comparison of the premiums paid and losses sustained by all mills showed for the average of the period 1923-32 that the damage amounted to 71.2% of the premiums paid, from 1933-42 to 53.5%, and from 1943-51 to 66.1%. An investigation of the damage sustained in pulp and paper storage showed that the losses (expressed as a percentage of the premiums paid) were much higher than for the entire industry and that the insurance rates are too low in this case. A comparison of the losses in pulp and paper stocks during the period 1923-51 indicates that pulp stocks accounted for 86.1% of the premiums paid and paper stocks, for 174.2%. As a result of this study the author concludes that an efficient reduction in the huge storage losses should be accomplished by greater segregation and subdivision of stocks and the avoidance of large accumulations in one block. 14 tables. E.S.

INTERIOR PACKING

CALNEVAR COMPANY, *Los Angeles.* Pre-engineered shipping package. Modern Packaging 26, no. 12: 107-9, 182 (August, 1953).

Designing the shipping package at the same time as their wire-wheel hub cap resulted in satisfactory packaging for the company. The carton, of which all components are 200-pound-test corrugated board, consists of a stressed spacer fitted around the bottom of the hub cap and a sunburst section placed on top of it; the top sunburst insert is in the form of a tray with the outer edges bent upward. The outer edges of the sunburst separators extend to the

sides of the carton, preventing the contact of the product with the sides of the box at any time. 6 illustrations. R.A.S.

ION EXCHANGE

THOMPSON, JOSEPH, *and others.* Mixed-bed ion exchange; a symposium covering theory, design of production units, and production results. Part I. Theory. Part II. Production results. Chem. Eng. Progr. 49, no. 7: 341-8; no. 8: 437-41; discussion: 441-2 (July, August, 1953).

Five of the papers presented in the symposium at the Chicago Meeting of the American Institute of Chemical Engineers are amalgamated to provide a succinct discussion of current theory and data on mixed-bed ion exchange with some consideration of the principal applications. Authors and titles of the papers included are: Thompson, Joseph, and McGarvey, Francis X. Theory of monobed exchange; Wantz, John F. Design of mixed-bed ion-exchange units; Alling, S. F. Engineering results with mixed-bed exchangers; Gilwood, M. E. Mixed-bed demineralizing of high-pressure boiler feed water; and Babb, David R. Applications of mixed-bed ion exchange. 9 tables, 13 figures, and 8 references. R.A.S.

LIGNIN

ADLER, ERICH. Some Swedish contributions to wood chemistry; a brief historical survey. Svensk Papperstidn. 56, no. 14: 517-22 (July 31, 1953). [In English]

An outline of the history of lignin research in Swedish laboratories, notably the work of Klason, Hägglund, C. Kullgren, and B. Holmberg and their collaborators, is given. 34 references. E.S.

HLAVA, JOSEF B., and BRAUNS, F. E. Oxidation of Willstätter lignin and methylated Willstätter lignin, and the behavior of veratric aldehyde under similar experimental conditions. Holzforschung 7, no. 2/3: 62-6 (1953). [In German; English summary]

Details are given for the alkali-nitrobenzene oxidation of Willstätter lignin (I) and its methylation product (containing 30.6% methoxyl) (II). (I) gave rise to vanillin (III) and vanillic acid (IV); (II) yielded, in addition to veratric acid, not more than slight traces of veratraldehyde (V). When (V) was subjected to a similar alkali-nitrobenzene oxidation, it was partially demethylated, giving (III) and small amounts of (IV). Similarly (V), when heated with alkali at atmospheric (or higher) pressure, gave (III) as well as (IV) (when air was present). It is evident that (III) obtained in the oxidation or alkaline hydrolysis of (II) need not necessarily originate from "inner lignin building stones," but may be formed from (V) by partial demethylation. Any conclusions from the ratio of (III) to (V) claiming to indicate that this is a ratio of inner to terminal lignin building stones are therefore invalid. 4 figures and 10 references. L.E.W.

SMITH, MANNING A., CELMER, FRANK, KRAUT, JOSEPH, WITKOSKI, FRANK C., and ZUCKERMAN, PHILIP. Concerning the Russell formula for gymnosperm lignin. Tappi 36, no. 8: 342-5 (August, 1953).

Black spruce periodate lignin has been reacted with hydroxylamine and *p*-chlorobenzaldehyde. The oxime and benzylidene condensation products ob-

tained contain less than 4.6% nitrogen and 5% chlorine, respectively. The Russell formula (*cf.* B.I.P.C. 18: 166-7) would call for products containing 7.3% nitrogen and 11.9% chlorine, respectively. This indicates that the Russell formula does not satisfactorily account for the properties of black spruce periodate lignin. 3 tables and 21 references. E.S.

WACEK, A. v., HÄRTEL, O., and MERALLA, S. Influence of adding coniferin on the lignification of carrot tissues cultivated in vitro. Holzforschung 7, no. 2/3: 58-62 (1953). [In German; English summary]

Using sucrose and nitrates as nutrients in 1-1.5% agar, small pieces of carrot tissue (I) were cultured both with and without the addition of coniferin (II). The degree of lignification, gaged by various staining reactions, was always much higher when (II) was present than in its absence. When (I) was grown first in the absence of (II) and then transferred to a medium containing (II), two zones could be distinguished in the newly developed (I)—an unlignified area and a highly lignified zone. Thus (II) is definitely effective in inducing lignification in (I). 2 tables, 8 figures, and 11 references. E.S.

LIGNIN—RADIOACTIVE EXPERIMENTS

BROWN, STEWART A., TANNER, K. G., and STONE, J. E. Studies of lignin biosynthesis using isotopic carbon. II. Short-term experiments with $C^{14}O_2$. Can. J. Chem. 31, no. 8: 755-60 (August, 1953); *cf.* B.I.P.C. 23: 558.

The formation of lignin in wheat plants from $C^{14}O_2$ during the period of rapid lignification, has been studied over the first few hours of photosynthesis by measuring the incorporation of C^{14} into the guaiacyl and syringyl portions of the lignin molecule. Plants grown 62 days from seeding were exposed to 20 microcuries of $C^{14}O_2$ in a closed chamber for 20 minutes, and grown for periods of one to 24 hours in a normal atmosphere before harvesting. Synthesis of lignin is most rapid four to six hours from activation; the syringyl residues apparently are formed more slowly than the guaiacyl. A slower rate of formation persists for the remainder of a one-day period, probably as a result of recycling in the carbon pool. Cellulose acquires C^{14} more rapidly than lignin during the period immediately following administration of $C^{14}O_2$, but after three or four hours, when synthesis of lignin has become rapid, the total C^{14} content of both components reaches about the same value. 1 table, 1 figure, and 8 references. E.S.

KRATZL, K., and BILLEK, G. Synthesis of lignin building stones, labelled with C^{14}. Holzforschung 7, no. 2/3: 66-70 (1953). [In German; English summary] *cf.* B.I.P.C. 23: 725.

The synthesis of 3-C^{14} coniferin, 2-C^{14} syringin, and the glucoside of 4-$HOC_6H_4CH:C^{14}HCH_2OH$ are fully described. In most instances the steps in these syntheses are similar to those given previously in the literature. 1 figure and 24 references. L.E.W.

MACHINERY

ANON. New Ross Engineering developments for modern paper machines. Paper Mill News 76, no. 29: 68, 70 (July 18, 1953).

Some of the more recent developments by the company include the Ross-Hooper totally enclosed hood, the new Ross pulp drier, an improved Yankee

air system, new nozzles, a new trim-conveying system, and an improved cylinder-mold exhaust system. 3 illustrations. E.S.

MACHINERY—BELTING

FORBES, B. R. How to install and maintain rubber belts. Paper Trade J. 137, no. 2: 16, 18 (July 10, 1953).

Directions are given for the correct installation and maintenance of rubber-transmission belting with a vulcanized splice (Plylock) on difficult paper-mill drives. 4 illustrations. E.S.

MACHINERY—BOARD MACHINES

ANON. Continental Can's new Fourdrinier board machine—the world's largest. Paper Trade J. 137, no. 5: 24-5 (July 31, 1953); Paper Mill News 76, no. 32: 17-19 (Aug. 8, 1953).

A description of the new Bagley & Sewall 250-inch trim Fourdrinier machine for drum-liner board at the Hopewell, Va. mill is given. 4 illustrations. E.S.

ANON. New automatic machine makes board from wood waste. Paper Ind. 35, no. 5: 554-6 (August, 1953); Mech. Eng. 75, no. 8: 654-5 (August, 1953); Chem. Eng. 60, no. 8: 130, 132, 134-5 (August, 1953).

A new automatic machine developed in England, called the Bartrev press, converts wood and wood wastes into high-quality, all-wood panels on a continuous basis. The raw material (wood shavings, bagasse, flax shives, etc.) is first reduced to uniform fragments of carefully controlled moisture content, mixed with 4-8% of inexpensive resins, and evenly distributed by a special feeder to an endless steel band which carries the material through a radio-frequency unit for preheating to the heated pressure zone of the press, where the resin is set and actual board formation takes place. An opposing upper steel band meets the sheet, and pressure exerted by six hydraulic units forms the flat panel. The finished board is then delivered in a continuous flow at speeds up to 30 f.p.m.; finally the strip is trimmed and cut to the desired length. The resulting panel is claimed to combine light weight with an attractive smooth surface. The first press is in continuous operation on a three-shift, seven-day week basis near London, England; several other presses are under construction for sale in the United States and Canada. 8 illustrations in the first and 6 illustrations in the second and third references. E.S.

FUSSELL, O. P. Cylinder machine operation. Paper Mill News 76, no. 29: 71-2, 118 (July 18, 1953).

The author reviews operational trends of the last 30 years of multicylinder machines producing various grades. The discussion covers counterflow and direct-flow vats, the press section, felts, felt and wire cleaning, showers, driers, calenders, and reels. E.S.

MACHINERY—CABLES

MORTENSON, A. O. Electric wire and cable recommendations for the pulp and paper industry. Tappi 36, no. 8: 161-3A (August, 1953); *cf.* B.I.P.C. 22: 832.

The report (TAPPI Engineering Division Project No. 369) summarizes the recommendations of the TAPPI Cable Subcommittee on the selection

of wire and cable for practically every department and service in the industry, as they apply to both American and Canadian mills. One exception, pertaining to paper-insulated cables peculiar to some Canadian mills, is discussed separately. 4 tables. E.S.

MACHINERY—CONSISTENCY REGULATORS

G. The regulator in practical operation. Wochbl. Papierfabrik. 81, no. 4: 117-19 (Feb. 28, 1953). [In German]

Difficulties with a Säll consistency regulator installed on a mixing chest fed by several beaters and the solution of the problem by constructional changes are described. 8 figures. E.S.

MACHINERY—CONVERTING MACHINERY

BLISS, JOHN H., and BLISS, FRED R. Development of stapling and stitching. Fibre Containers 38, no. 6: 80, 85-6 (June, 1953).

The development of box stitchers from the early beginnings around 1912 to semiautomatic stitchers and fully automatic folder-stitcher units for solid and corrugated board and large-sized panels operating at high speeds is reviewed. 10 illustrations. E.S.

MACHINERY—ELECTRIC EQUIPMENT

MELOUN, C. J. Maintenance of electronic controls in paper mills. Part I. Electrical maintenance in paper mills; maintenance of electronic controls. Part II. Paper Trade J. 137, no. 3: 14-18; no. 6: 21-6 (July 17, Aug. 7, 1953).

The author describes the most effective procedures for maintaining all types of electronic control apparatus in paper mills in good operating condition. A trouble-shooting chart is included, listing troubles, reasons, and remedies of general electronic and magnetic control equipment. 1 table and 6 figures. E.S.

MACHINERY—KOLLERGANGS

SCHRÖTER, HELMUT. A contribution to the understanding of the kollergang effect. Wochbl. Papierfabrik. 81, no. 8: 267-72; no. 9: 303-6 (April 30, May 15, 1953). [In German]

With reference to the recent study by Brecht (*cf.* B.I.P.C. *22*: 179) on the characteristic effect of kollergang treatment on pulp, the author studied the kollergang-induced curling of fibers further and came to the following conclusions: The curling originates from the continued twisting of the fibers between the runner stones, whereby the fiber is once pulled, then again compressed until it is damaged and tears. Since relatively dry conditions are employed in the kollergang—at least in comparison with the beater—a certain amount of dewatering also takes place. At the conclusion of the treatment, the fibrous material exhibits the following characteristics: shortening, damage (or weakening), and curling (bending). The shortening may be considerable; the bending factor is less than that exhibited by thermochemically curled fibers. The fibers are twisted, no longer transparent, and thinner than prior to the treatment; drainage properties are improved. On sheet formation a less dense structure is obtained. The increase in volume results from the large amount of short-fibered material and the presence of fiber debris, particularly in the middle fraction. Curling is not the reason for the increase in volume, because it is lost on subsequent beating in the hollander. The kollergang-treated pulp is weakened to such an extent that it can no longer withstand the intensity of hollander beating; additional short-fibered material

is produced in place of the mucilage formed by pulp which has received no previous kollergang treatment. The lack of mucilage is also the reason for the absence of transparency. The properties of kollergang-pretreated pulp are a consequence of the weakened and shortened fiber material. Papers produced from such pulps have lower strength properties, but higher absorptivity and air permeability. Detailed data on the experimental procedures employed by the author to arrive at these conclusions are given. 4 tables, 5 photomicrographs, 6 figures, and 6 references. E.S.

MACHINERY—PAPER MACHINE

ANON. Five new Beloit paper machines. Paper Mill News 76, no. 29: 58, 60, 64 (July 18, 1953).

Brief descriptions of the five new paper machines built by Beloit for Detroit Sulphite Pulp & Paper Co. (lightweight sulfite specialties), Halifax Paper Co. (wide range of kraft paper and Fourdrinier board), St. Regis Paper Co. at Jacksonville (kraft paper), Westminster Paper Co. (dry crepe production), and Weyerhaeuser Timber Co. at Longview (bleached kraft specialty papers and boards) are given. 3 illustrations. E.S.

ANON. Mando puts No. 3 machine into operation after modernization. Paper Ind. 35, no. 4: 418-19 (July, 1953).

The complete modernization of the No. 3 paper machine making diversified groundwood and sulfite specialties at the International Falls mill of Minnesota & Ontario Paper Co. includes a sectional electric drive, a size tub and breaker stack between the second and third drier sections, and a Fulton drier-drainage system embodying forced-vapor circulation. 8 illustrations. E.S.

ANON. Six new Pusey Jones paper machines. Paper Mill News 76, no. 29: 69-70 (July 18, 1953).

The company has built and installed six new machines during the past year, five paper and board machines in the United States and a Fourdrinier board machine in Colombia, South America. The United States installations were made at the Nekoosa-Edwards Co. (various grades of business and high-grade wrapping papers), the Brown Paper Mill Co. (light- and medium-weight kraft bag and wrapping paper), Union Bag and Paper Corp. (kraft bag papers), St. Joe Paper Co. (kraft liner board), and West Tacoma Newsprint Co. (newsprint). In addition, a number of alterations and additions were made to existing machines. 3 illustrations. E.S.

ANON. West Virginia starts up new Beloit #8. Paper Mill News 76, no. 29: 48, 50 (July 18, 1953); Southern Pulp Paper Mfr. 16, no. 8: 26, 28, 30 (August, 1953); Paper Ind. 35, no. 5: 529-30 (August, 1953); Tappi 36, no. 8: 91-4A (August, 1953).

The new Beloit Fourdrinier machine (which replaces two small obsolete units at the Covington, Va. mill) is designed primarily for the production of heavy grades of high-quality bleached paperboard from local hardwood pulp to be used in the manufacture of different food containers, including milk bottles; however, its flexibility permits the manufacture of almost any grade or basis weight which future market conditions may dictate. Details of the installation and names of the suppliers are given. 2 illustrations in the first and 4 in the second, third, and fourth references. E.S.

KIDD, J. D. A study of the mechanics of the paper making machine. Paper-Maker (London) 126, no. 1: 10-12, 14 (July,

1953); World's Paper Trade Rev. 140, no. 7: 483-4, 486, 488, 493-4 (Aug. 13, 1953).

The Fourdrinier machine of relatively slow speed on which a variety of papers of different basis weight are manufactured is not generally considered a very efficient piece of mechanism when compared with a high-speed, one-quality machine. On the general-purpose machine quality is more important than quantity. The object of the present paper is the assessment of the efficiency of each individual section of such a machine from stuff chests to drive, taking one ton/inch of wire width/week of 132 hours as a basis of the tonnage produced. An attempt is made to show that this figure can easily be obtained and the quality maintained. In case of contemplated alterations to an existing machine, particular attention is drawn to those sections which might be improved. E.S.

WATSON, IAN. Mosinee rebuilds #1 Beloit paper machine. Paper Mill News 76, no. 29: 52, 54-5 (July 18, 1953); *cf.* B.I.P.C. 23: 653.

The modernization of the No. 1 paper machine (including the beater room) resulted in a considerable increase in production capacity and an increase in flexibility in the manufacture of sulfate specialty papers; the details of the reconstruction of the various machine sections are outlined. All major machine parts were supplied by Beloit Iron Works; the engineering was done by Charles T. Main, Inc. in conjunction with the mill staff. 3 illustrations. E.S.

MACHINERY—PULPERS

BLACK-CLAWSON COMPANY. Black-Clawson (Shartle & Dilts). Tappi 36, no. 8: 112-13A (August, 1953).

Under a licensing arrangement between the Black-Clawson Co. and the Cowles Co., the Shartle Brothers Machine Division of the former will manufacture and sell four major items of Cowles stock-preparation equipment, including the Aquapulper under the trade name of Hydraslusher, the Beatapulper under the trade name of Hydrabeater, the Classapulper (a new continuous pulper for either virgin or waste-paper stock), and the Knifemill, a refiner-type unit; no name changes are at present contemplated for the last two. The Shartle Division will also manufacture the Shartle-Strindlund tube-type filter under licensing agreements with the Swedish manufacturer. This filter is able to handle any pulp- or paper-mill filtering, thickening, or washing application. In conclusion, reference is made to the new Model "UA" single-position unwind stand and the Model 20 continuous two-arm winder built by the Dilts Machine Works Division of the company. 3 illustrations. E.S.

RENARD, J. The adaptation of pulpers to mills with diversified production. Papeterie 75, no. 6: 383, 385, 387 (June, 1953). [In French]

Hydrapulpers in the United States are generally used in integrated mills or those with mass production of one grade of paper or board. Conditions in France are different, and troubles are sometimes experienced when Hydrapulpers are used for the disintegration of dry purchased pulp, groundwood pulp in particular. Wet-strength paper cannot be satisfactorily treated in Hydrapulpers. Low-grade mixed waste papers require additional equipment (rag catchers, junk removers, etc.) which make the installation more complex. The treatment of different types of stocks in different pulpers is only economically feasible when sufficiently large quantities are involved. Where

this is not the case the author recommends the retention of the old-fashioned kollergangs, disintegrators, etc. and their use for the pretreatment of the difficult stocks which, when properly defibered, are then added to the Hydrapulper. 1 diagram. E.S.

MACHINERY—SAVE-ALLS

SIMPSON, R. W., and SAMSEL, J. J. Paper mill waste treatment. Paper Ind. 35, no. 5: 551-3 (August, 1953).

Various types of savealls (Bird, Adka, Sveen-Pedersen), high-rate clarifiers, and combinations of clarifiers and savealls, as applied to mills making a variety of products including asbestos paper or board, are described. 8 flowsheets. E.S.

MACHINERY—SCREENS

STEVENS, W. C., LYNCH, A. P., and ESTES, P. W. Converting to high capacity pulp screens. Tappi 36, no. 8: 372-4 (August, 1953).

The experience of one mill in converting from small-capacity screens to Cowan centrifugal pulp screens in both groundwood and sulfite mills is described. The value of screen-plate coating is indicated, and maintenance problems are outlined. E.S.

MACHINERY—SLITTERS AND WINDERS

ANON. New Cameron slitters and rewinders. Paper Mill News 76, no. 29: 66, 121 (July 18, 1953).

A brief reference is made to Camachine installations during the past year, and some of the significant engineering advancements in their construction are given. 3 illustrations. E.S.

ANON. Rewinding in excess of 5000 feet per minute. Southern Pulp Paper Mfr. 16, no. 7: 38 (July, 1953); Paper Ind. 35, no. 4: 420 (July, 1953); Tappi 36, no. 8: 113-14A (August, 1953).

A Cameron Imperial 100 rewinder installed on the No. 1 paperboard machine in the Charleston plant of the West Virginia Pulp and Paper Co. is capable of handling log rolls of corrugating and liner board up to 234 inches wide, with diameters of 72 inches; it operates at speeds exceeding 5000 f.p.m. The special features of its construction are described briefly. 2 illustrations in the first and 1 in the second and third references. E.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

A. Cleaning of pulp in pipe dirt separators. Wochbl. Papierfabrik. 81, no. 5: 151-3 (March 15, 1953). [In German]

The mode of operation of pipe dirt separators employing centrifugal force (like the Vortrap and similar devices) and the factors upon which efficient dirt removal depends are discussed. Two machines which employ a somewhat different principle are mentioned: the Hydraclone or Hydrafuge built by Shartle in America (in which the purified stock is discharged at the bottom) and the Assablador built by Escher-Wyss in Germany (in which the stock suspension containing the impurities is drawn off by light suction at the point of flow reversion and subjected to a separate second treatment). 3 diagrams. E.S.

MACHINERY—VORTRAP

TRAWINSKI, H. The hydrocyclone as auxiliary equipment for

the refining of basic materials. Chem.-Ing.-Tech. 25, no. 6: 331-41 (June, 1953). [In German]

An extensive review of the fundamental principles of construction and flow, the development, and applications of cyclone separators (including references to the Vortrap in the pulp and paper industry) is presented. 22 figures and 53 references. E.S.

MACHINERY—WEB-TENSION CONTROL

JÖRG [O.] Continuous measurement of web tension in calenders. Wochbl. Papierfabrik. 81, no. 5: 155-6 (March 15, 1953). [In German]

A meter for indicating irregularities in web tension during calendering built by Karl Frank is described briefly. 4 figures. E.S.

ROHRBAUGH, N. B., and CASSIDY, G. E. The paper tensiometer. Paper Trade J. 137, no. 2: 14-15 (July 10, 1953); *cf.* B.I.P.C. 23: 646.

At the P. H. Glatfelter Co., Spring Grove, Pa. eight tensiometers are used to indicate web tension and control machine sections (driers, size presses, calenders, and reel sections of sectional paper-machine drives). The construction of the instrument, method of mounting, and its operation are outlined. 4 illustrations. E.S.

MACHINERY—WEB TRANSFER

BURNETT, R. W. Vacuum transfer from wire to press section. Paper Mill News 76, no. 29: 74, 76, 118 (July 18, 1953); Southern Pulp Paper Mfr. 16, no. 8: 36, 38, 41 (August, 1953); Can. Pulp Paper Ind. 6, no. 8: 11-12, 44 (August, 1953).

The Beloit machine designed for a maximum speed of 2000 f.p.m. at Crossett, Ark. (No. 2 machine) and the application of a suction transfer according to specifications of K. E. Elderkin are described in some detail. E.S.

MATERIALS HANDLING

ANON. Modern equipment reduces handling costs & damage. Can. Pulp Paper Ind. 6, no. 7: 14, 16 (July, 1953).

The replacement of manual handling of newsprint rolls with an Elwell-Parker roll clamp truck at the plant of the *Youngstown Vindicator* (a daily newspaper published in Youngstown, Ohio) and the resulting advantages of an increase in efficiency and a reduction in manpower, damages to rolls, and costs are described briefly. 2 illustrations. E.S.

GEO. W. KING LTD. *Hitchin, Herts., England.* Mechanical handling in the mill; new lifting gear developments for the paper and allied trades. World's Paper Trade Rev. 139, no. 19: 1404, 1406 (May 7, 1953).

The King reel grab suspended from an overhead traveling crane will elevate paper reels from the vertical or horizontal position; the principle of operation is outlined. 2 figures. E.S.

MILL MANAGEMENT

FISHKIN, CHARLES I. Maintenance of power plant equipment. Southern Pulp Paper Mfr. 16, no. 8: 41-4 (August, 1953).

The author outlines a program of planned and breakdown maintenance and discusses frequency of inspection, size of crew, and comparative plant-maintenance cost; a lubrication and an economizer-fouling problem and their possible solution are given as examples. E.S.

GRAVELEY, O. W. Management and "managed maintenance"; maintenance in medium-sized plants (101-300 maintenance employees). Southern Pulp Paper Mfr. 16, no. 8: 46-7, 50-2 (August, 1953).

The program of systematic control of maintenance of the Electro Metallurgical Co., a division of Union Carbide and Carbon Corp. at Niagara Falls is outlined. E.S.

KELLER, J. A. Job evaluation . . . the installation and administration of a program. Part 6. Paper Ind. 35, no. 4: 460 (July, 1953); *cf.* B.I.P.C. 23: 815.

The final steps needed to install a sound wage program include the selection of a qualified person to administer the program, the installation of the plan to cover present jobs and employees, and the establishment of a procedure to insure the proper maintenance of the program. These three phases are discussed briefly. 1 table. E.S.

OSBORNE, DON. Improving key personnel; Crown Zellerbach's four step organized program. Pulp & Paper 27, no. 7: 30-1 (July, 1953).

The company's organized plan for improvement of key people includes the following four steps: a definition of the organizational structure and the duties and responsibilities which each position involves, the determination of the manpower needs of the organization over a period of time, a management inventory of the present management team and those preparing for the team, and the development of individuals through group and personalized training. A case history of a personalized training plan is included. E.S.

WINEGARNER, C. Were you trained to be a supervisor? Paper Mill News 76, no. 32: 15-16 (Aug. 8, 1953).

Success in supervision is not attained by accident; it is the result of the careful execution of a well-organized plan over a long period of time. Today numerous agencies, either privately owned or publicly financed, are prepared to give management some assistance in training supervisory staffs in the science of handling people. In Wisconsin, much of this training is offered through the facilities of the Wisconsin Schools of Vocational and Adult Education, which include numerous courses in personnel and supervisory training. The programs of some of these courses are described briefly. E.S.

OXIDATION-REDUCTION

KONOW, RUBEN VON. A new oxidation theory. Paper and Timber (Finland) 35, no. 7: 285-94 (July, 1953). [In English]

Following a review of important previous theories, a new theory for the oxidation of difunctional glycols—including starch and cellulose—is presented. Fundamental to this theory are: (1) the values for ion radii are those commonly accepted; (2) the value of 6 is taken for the co-ordination number for heptavalent iodine surrounded by bivalent oxygen ions in water solution; (3) the atom distances in the covalent bonded glycols are those commonly

used; (4) the carbon atoms in glucose (e.g., cellulose or starch) are either coplanar or tetrahedral or a model between these two; and (5) the reacting molecules in question are hydroxyl compounds and, consequently, have a tendency to combine with one another with hydrogen bonds. 3 tables, 8 figures, and 20 references. J.O.T.

PACKAGING

ANON. Carding techniques. Modern Packaging 26, no. 12: 104-6 (August, 1953).

The method of packaging used by Monowatt, a department of General Electric Co., in Providence, R.I., is described; it consists of stapling sales items to a display card on which directions for use of the item and illustrations showing application have been printed. Die cuts are used where possible for the fastenings. Advertising design and advantages are stressed; the process of carding is described. 5 illustrations. R.A.S.

BERNOT, A. Paper and board packaging, the servant of hygiene. Papier, carton et cellulose 2, no. 3: 52, 55-6 (July-August, 1953). [In French]

Although definite regulations with regard to sanitary packaging exist in France, their application is not always strictly enforced. The author describes examples of nonobservations of the existing rules and gives suggestions for improving conditions; education of the consumer is an important step. E.S.

PAPER—DEFECTS

ANON. Books lose their freckles. Monsanto Mag. 32, no. 4: 22-3 (August-September, 1953).

Chloramine-T, a standard germicide, disinfectant, and deodorant is recommended as a bleaching agent in the restoration of books. The fine white powder, dissolved in water and applied to the page with a brush will remove foxing. 3 illustrations. R.A.S.

THOMPSON, L. P. [Moderator] Paper defects. Tappi 36, no. 8: 132-4A; discussion: 135A (August, 1953).

The following participated in this panel discussion and presented brief papers: Dana, Howard H. (Paper Division, Curtis Publishing Co., Philadelphia), a consumer of book papers; Nicolson, Hugh T. (National Vulcanized Fibre Co., Yorklyn, Del.), manufacturers of 100% rag waterleaf paper for later treatment within the company; Smith, E. R. (Union Mills Paper Manufacturing Co., New Hope, Pa.), manufacturers of high-quality insulating paper for high-tension power and telephone cables; Moon, Willard H. (National Paper Corporation of Pennsylvania, Ransom, Pa.), manufacturers of dry-creped facial tissue; and Lowe, Malcolm, Jr. (Lowe Paper Co., Ridgefield, N.J.), off-machine coaters. E.S.

PAPER—MERCHANDISING

THE NATIONAL PAPER TRADE ASSOCIATION. The cost of storing, handling and delivering paper. Cost of paper merchandising; additional data concerning the storing, handling and delivery of paper from the N.P.T.A. study. Paper & Twine J. 27, no. 5: 12, 18-21; no. 6: 9, 28-9 (July, August, 1953).

Excerpts are given from the booklet "The cost of storing, handling and

delivering paper" prepared by the association from data acquired by questionnaires sent to 46 firms. Average results for merchants of fine paper and wrapping paper, and dual houses are included on cost/order of 50, 100, 500, and 2000 pounds; workers' earnings; pounds stored/sq. ft. of gross warehouse area; and expense ratios of storage, handling, and delivery to total gross trading margin on warehouse sales. The data show that the storage, handling, and delivery of paper from warehouse inventories accounts for approximately one third of the gross income from warehouse sales. The operating costs for fine-paper firms are considerably higher than for wrapping-paper houses, whereas the operating costs for dual merchants more closely approximate those of fine-paper merchants. 8 tables and 2 illustrations. R.A.S.

PAPER—PHYSICAL PROPERTIES

Cox, H. L. The elasticity and strength of paper and other fibrous materials. Brit. J. Appl. Phys. 3, no. 3: 72-9 (March, 1952).

An analysis is made of the effect of orientation of the fibers on the stiffness and strength of paper and other fibrous materials. It is shown that these effects may be represented completely by the first few coefficients of the distribution function for the fibers in respect of orientation, the first three Fourier coefficients for a planar matrix and the first 15 spherical harmonics for a solid medium. For the planar case it is shown that all possible types of elastic behavior may be represented by composition of four sets of parallel fibers in appropriate ratios. The means of transfer of load from fiber to fiber are considered, and it is concluded that the effect of short fibers may be represented merely by use of a reduced value for their modulus of elasticity. The results of the analysis are applied to certain samples of resin-bonded, fibrous-filled materials, and a moderately good agreement with experimental results is found. 2 tables and 3 figures. E.S.

PAPER—SHEET FORMATION

GOUMENIOUK, GLEB I. The problem of air in paper stock. Can. Pulp Paper Ind. 6, no. 8: 8-10, 25 (August, 1953).

With the higher machine speeds of the day, air plays a most important but unrecognized part in machine performance. This importance is principally related to the fact that air cannot be seen and that the visible effects of its disturbing presence are rarely associated with the true cause. The occurrence of air at the high speeds is not confined to restricting boundaries; air may be induced into and contained in regions in which it could not possibly stay if the machine were slowed down. The author traces the effects and behavior of air in the stock on the drainage and sheet formation of a Fourdrinier machine. The air dispersed in the stock during preparation and flow through the headbox; eddies and headbox turbulence; the presence of acceleration and deceleration regions when the stock approaches the slice; the accumulation of air near the slice; the tendency for inducing air between the slice and breast roll; the presence of an improperly designed and positioned forming board; impulse drainage; the performance of table rolls in the presence of air; the use of inter-roll, wire-supporting baffles; and the function of suction boxes are considered in relation to the problem. In conclusion, the author emphasizes that the proper preparation of the sheet for the dewatering treatment at the suction couch depends on the whole drainage process from the beginning to the end, i.e., good sheet formation is the result of a uniform slice discharge and of well-controlled and distributed drainage. The interruptions which the presence of air causes in the flow of the liquid create shock forces which damage the structure of the sheet to a far greater extent than would result from poorly organized drainage in the absence of air. 5 figures. E.S.

LINDBERG, NILS J. Research possibilities of sheet formation. Paper Mill News 76, no. 29: 88, 91-3, 95-6, 102, 104, 118 (July 18, 1953); *cf.* B.I.P.C. 23: 110-11.

This is a somewhat abbreviated translation of the Swedish original. 2 tables, 12 figures, and 12 references. E.S.

PAPER AND PULP INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION. How much will our industry grow? Paper Trade J. 137, no. 5: 12-14 (July 31, 1953).

The results of a survey indicate that the annual capacity of paper and board will increase from 26.9 million tons at the close of 1952 to 28.5 million tons at the end of 1953 and 29.3 million tons at the end of 1954. At the end of this period, the capacity of the paper industry as a whole will be 43.5% more than at the close of 1946; paperboard mills will have increased their capacity by 57.4%, and paper mills by 30.5%. In both 1953 and 1954, the major increase in capacity will occur in paperboard. The industry capacity to produce wood pulp will increase by 2.5 million tons from the end of 1952 to the end of 1954. Of this increase, dissolving grades will account for 400,000 tons and paper grades for the rest. The capacity to produce sulfate pulp will undergo the largest expansion, amounting to 66% of the total; the remainder will be provided by increases in semichemical and groundwood pulp, whereas the capacity to produce sulfite and soda pulps will remain practically unchanged. 5 tables and 2 diagrams. E.S.

BOYCE, CHARLES W. Paper and printing. Paper Mill News 76, no. 26: 12-14, 16-19 (June 27, 1953); *cf.* B.I.P.C. 23: 260.

Although the use of paper for printing has increased 10 times this century to 9.5 million tons and per capita use has doubled, this segment accounts for only 30% of total paper consumption compared with 45% in earlier decades. The author is therefore investigating the possibility whether or not the printing paper segment is approaching maturity. Census data for 1939 and 1947 are reclassified and reassessed, obtaining figures of tonnages of printing papers used in the various parts of the publishing and printing industry. Newsprint accounts for 60% of the paper; machine-coated book paper use has increased most sharply. The substitution of less expensive papers and mill shifting or upgrading have been the most important trends. About 60% of printing papers are used for advertising. Less paper is required for smaller colored advertisements. Paper used by printing and publishing as a percentage of disposable income is showing downward trends. Many other media compete with paper. Figures are presented which indicate that the cost of paper to printers has risen more than other costs and that paper is losing its ability to compete. In the past American business has spread the increased cost of materials by ever-increasing volume. This may no longer be possible if the author's hypothesis is correct. He hopes that the stagnant and dangerous concept of seeking profits on low volume (through high margin of markup) does not gain a hold on business thinking under these conditions. Rather, what is needed is a long-run fundamental research program so that paper will be able to compete and volume will be maintained. 2 tables and 9 diagrams. H.B.

FOWLER, R. M. Factors in soundness of pulp & paper industry. Pulp Paper Mag. Can. 54, no. 8: 91-4 (July, 1953).

The author expresses the opinion that the Canadian pulp and paper industry is sounder today than it has ever been before and supports this opinion by outlining some of the strengths that have been built up and some of the

problems facing the industry. Statistics are cited to show improvements in the financial picture of the industry. R.A.S.

MATHESON, WILHELM. Pulp and paper of Norway. Can. Pulp Paper Ind. 6, no. 8: 50, 52 (August, 1953); World's Paper Trade Rev. 139, no. 20: 1503-4, 1506 (May 14, 1953).

A brief outline of the Norwegian pulp and paper industry, including statistical and historical information, is given. E.S.

PAPER AND TIMBER (FINLAND). Some features of the development in the Finnish forest industry during 1952. Paper and Timber (Finland) 35, no. 4a: 101-5, 108-21 (Special issue, April, 1953). [In English]

A review is presented of the modernization and expansion in the Finnish forest industries during 1952 and the early part of 1953 under the subdivisions: sawmill industry, timber houses, plywood industry, spool industry, mechanical pulp industry, chemical pulp industry, paper industry, converted paper and board, board industry, wallboard industry, power and steam plants, transports, and social. Brief market reports are included at the beginning of each section. 35 illustrations. E.S.

SHARP, M. W. What we need is . . . sustained world trade without monetary restrictions. Pulp Paper Mag. Can. 54, no. 8: 94-6 (July, 1953).

The author, an assistant deputy minister of the Canadian Department of Trade and Commerce, discusses the main problem besetting world trade, namely, the restrictions placed on imports by those countries unable to make dollar payment. Reasons for these restrictions are examined and solutions suggested, the final achievement being high trade without high restrictions. R.A.S.

SHIPMAN, GEORGE. South Africa's forests and paper industry. Pulp Paper Mag. Can. 54, no. 8: 166, 168, 170 (July, 1953).

The author describes the reforestation project which he observed in South Africa and considers the possible effects this large-scale rapidly growing operation will have on the industry of the northern climates. He believes that in many cases the quality of newsprint made from woods grown in this area will not be equivalent to that made from spruce, but it can meet the needs of the countries who have to produce these papers. The loss of many of these former markets, however, will have little effect, since the demand for new and different types of paper has increased considerably in the United States and Canada. R.A.S.

STEVENSON, LOUIS T. The United States paper industry—a review and forecast. Tappi 36, no. 8: 14A, 16A, 18A, 20A, 22A, 24A, 26A, 28A (August, 1953).

The paper industry deserves more careful attention on the part of institutional investors than it is generally receiving. This study is intended to bring out the present situation of the industry and to suggest some of the problems which the investor should consider in connection with his choice of holdings. It is divided into three parts. Part I indicates: (*a*) growth patterns of major segments of the industry and of the industry as a whole and (*b*) the relative stability of earnings in the industry. The lists of companies in Part

I (*a*) are illustrative only. The companies mentioned, though important in the fields indicated, do not cover the entire activity in these grades; there are many other qualified suppliers. Part II deals with the economic characteristics including past and current price behavior. Part III includes short- and long-term forecasts of production trends. 5 tables and 6 figures. E.S.

STOCKMAN, LENNART. Characteristic features of modern Swedish cellulose industry. Svensk Papperstidn. 56, no. 14: 523-30 (July 31, 1953). [In English]

The author discusses bleached kraft pulp, prehydrolyzed sulfate pulp, continuous cooking of sulfate pulp, by-products (alcohol and tall oil), and the evaporation and burning of spent sulfite liquor. 3 tables and 7 figures. E.S.

TURNER, JOHN S. Milestones 1913-1922. Pulp Paper Mag. Can. 54, no. 8: 76-91 (July, 1953); *cf.* B.I.P.C. 23:899.

The author continues his review of the notable events in the history of the industry and discusses the effect of a world war and postwar economic problems. 1 table listing the mills operating in Canada in 1915 and 7 illustrations of various mills. R.A.S.

WILSON, M. L. South—land of opportunity. Paper Mill News 76, no. 25: 136 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 7: 92-4 (July, 1953).

The technological revolution and the expanding scientific research in the South are described briefly, supplemented by some statistical data. The chemical industries are taking the lead in this development; the many pulp and paper projects are also contributing to the prosperity of the area. A picture "Power of the South" shown at the end of the original presentation illustrated the power development of the region. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

CITY AND GUILDS OF LONDON INSTITUTE. City and Guilds examinations. Paper-Maker (London) 126, no. 2: 118-20 (August, 1953); World's Paper Trade Rev. 140, no. 5: 304, 306, 308 (July 30, 1953); *cf.* B.I.P.C. 23: 191.

The regulations and syllabuses for the year 1953-54 for paper technology are given. E.S.

PAPER AND PULP MILLS

ANON. Expansion of Bromptonville mill of Richmond Pulp and Paper Co. Paper Trade J. 137, no. 4: 14-17 (July 24, 1953).

The expansion of this newsprint mill in Quebec includes a new semichemical pulp mill, a new groundwood mill, a new (second) paper machine (built by Dominion Engineering), and modernization and improvements of the existing equipment. The mill uses spruce in the groundwood mill and birch and poplar in the semichemical pulp mill; two grades of semichemical pulp are prepared. One uses technical-grade sodium sulfite and soda ash for newsprint manufacture, and the other sodium sulfite and liquid caustic soda in the preparation of lapped pulp used in a small mill in the vicinity for making corrugating medium. This is the first commercial application of semichemical pulp to replace the major portion of sulfite in newsprint. At present the furnish consists of 85% groundwood, 10% neutral sulfite semichemical pulp, and 5% purchased sulfite pulp. It is believed possible that in

the future the sulfite now added will be replaced entirely by semichemical pulp. The newsprint is of excellent quality. 7 illustrations. E.S.

ANON. M. Peterson & Søn's new paper mill. Norsk Skogind. 7, no. 7: 227-30 (July, 1953). [In Norwegian]

The modernization program of the pulp and paper mill at Moss, Norway involved the construction of a new building to house a Fourdrinier paper machine built by Walmsleys (Bury) Ltd.; operations started in December, 1952. A brief description of the machine and auxiliary equipment is given; the machine is built for the daily production of 70-80 tons of kraft paper, bag paper, and liner in particular, and a maximum speed of 1200 f.p.m. It is driven by an electrical sectional drive delivered by Siemens-Schuckertwerke. A new feature is the installation of a Sulzer vacuum system on the wet end of the machine; the vacuum is produced by two turbo vacuum compressors. 5 illustrations. E.S.

ANON. A new South African mill. Paper-Maker (London) 126, no. 2: 102, 104 (August, 1953).

The progress at the new kraft pulp and paper mill under construction at Mandini on the Tugela River by South African Pulp and Paper Industries, Ltd. is reported; the mill is expected to be ready early in 1954. The plant is designed to produce initially 100 tons of wrapping paper and liner and fluting paper for corrugated board; the manufacture of bag paper at a later date is also planned. Pine and *Eucalyptus saligna* will be used as the principal raw material; this combination has been successfully employed in Australia. The pulp mill houses four digesters, and the paper mill, the 170-inch Fourdrinier machine built by Walmsley's. A far-sighted afforestation scheme is already under way. E.S.

PAPER INDUSTRY. Halifax Paper's latest modernization project. Paper Ind. 35, no. 4: 446-9 (July, 1953); *cf.* B.I.P.C. 23: 820.

The modernization of the company's mill at Roanoke Rapids, N.C., including a new Beloit paper machine, is described. 11 illustrations of the equipment. E.S.

PULP & PAPER. Nekoosa expansion based on coordinated long-term plans. Pulp & Paper 27, no. 7: 38-40, 42-3, 45-6 (July, 1953); *cf.* B.I.P.C. 23: 496, 497.

An illustrated description of the recent expansion program at the Nekoosa, Wis. mill of the company is given. 32 illustrations of the mill and its equipment. E.S.

WESTERBERG, S. The Swedish wood pulp industry. Svensk Papperstidn. 56, no. 14: 559-64 (July 31, 1953). [In English]

A list of Swedish chemical pulp producers is presented in tabular form, giving location of mill, name of man in charge, daily production (sulfite or sulfate pulp and whether sold or used in integrated unit), and by-products manufactured. A map showing the distribution of the Swedish wood-pulp industry is included. 1 table and 1 map. E.S.

PAPER AND PULP MILLS—WATER SUPPLY

PIRIE, G. W., and CHESTER, C. A. Water utilisation in the papermill. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 1: 119-30 (February, 1953).

Methods are described for calculating the water consumption and pulp-washing efficiency of papermaking processes by investigating the flows and dilutions employed. Formulas and tables give the ideal results attainable with any number of stages of simple or counterflow washing. Recirculation is shown to have no influence on washing efficiency; its effect on the rate of reaching equilibrium is calculated. The water utilization of a two-machine mill is compared with the theoretical value. It is shown that in a typical paper mill with restricted water supplies washing can be improved by the use of modern equipment intelligently planned for the purpose. Considerable material economies and a better heat balance can be obtained at the same time, and the river-pollution problem will be ameliorated. Economically better results can be obtained by improving the water utilization than by treating the existing effluent. In the case of planning the construction of a new mill, the capital cost of new washing devices will be offset by economies in the water-treatment plant, whereas losses of fibers, fillers, and chemicals are minimized. In some cases, sites could be selected for a mill, which would otherwise not be considered suitable because of the meager supply of fresh water. 8 tables and 1 diagram. E.S.

PAPER CONDITIONING

WILLETS, WILLIAM R. Conditioning and weathering of paper. In Symposium on conditioning and weathering, ASTM special technical publication no. 133: 35-40; discussion: 41 (Philadelphia, Am. Soc. Testing Materials [c1953]).

The main atmospheric component in the conditioning of paper is relative humidity which determines moisture content. This moisture acting as a plasticizer affects strength, rigidity, and plasticity. Changes in moisture content produce dimensional changes in the fibers which, in turn, are translated into over-all dimensional changes in the sheet. Examples are given showing the importance of relative humidity in testing, specification, converting, and end use. Other conditioning and weathering factors are discussed. E.S.

PAPER MANUFACTURE

ANON. The A B C of papers and boards. Papetier 7, no. 5: 54-6 (May, 1953). [In French] *cf.* B.I.P.C. 23: 727.

This section in a series of articles covers esparto paper, trimming, doctors, vegetable parchment, and waxed paper. E.S.

ANON. The A B C of papers and boards. Papetier 7, no. 6: 33, 35-6 (June, 1953). [In French]

Very light coating of printing papers with paraffin to improve their dimensional stability, nitrating paper, celluloid and cellulose acetate, rayon, blotting paper and methods for measuring its absorptivity, and slip-sheet paper are discussed in this installment. E.S.

ANON. The A B C of papers and boards. Papetier 7, no. 7: 23, 25-6 (July, 1953). [In French]

The author describes the use of bristol cards, the use of paper in different colors for business forms, the use of waste paper, and the application of paste to paper used for posters, as wallpaper, and in laminating paper to a board backing without warping of the latter. E.S.

'FOURDRINIER.' Changing trends in paper usage. Brit. Printer 66, no. 391: 73-4 (July-August, 1953).

The author discusses machine-coated paper, the use of straw as a raw material in papermaking, and the introduction of new shades of white (designated as dead flat white). 2 illustrations. E.S.

RANCE, H. F. Progress in pulp and paper making technology during 1952. Paper-Maker (London) 126, no. 1: 34, 37-40, 42-4 (July, 1953).

This review is intended to give an idea of the general trends of developments of more than passing interest during 1952 under the general headings: fibrous raw materials and pulp production (new raw materials, semichemical pulping of hardwoods, straw, and softwoods); stock preparation (bleaching, beating, pulp cleaning, and groundwood); papermaking (wet and dry end of the machine); paper testing; and general bibliography. 83 references. E.S.

PAPER SPECIALTIES

ANON. Deckle-edged paper; genuine and artificial deckle edges. Allgem. Papier-Rundschau no. 10: 419-20 (May 20, 1953). [In German]

The manufacture of handmade, mold-made, and machine-made deckle-edged papers, the differences between them, and methods for differentiation are described. E.S.

ANON. Electric insulating papers. Papier, carton et cellulose 2, no. 3: 61-2 (July-August, 1953). [In French]

The use requirements of cable paper (either high-power or telecommunication cables) and coil papers are described. 4 illustrations. E.S.

ANON. It's in the bag. Monsanto Mag. 32, no. 4: 30-1 (August-September, 1953).

Products of the Kennedy Car Liner & Bag Company, Inc. are described; the company specializes in designing covers and liners for unusually shaped articles. Products are made from flat, creped, laminated, coated, reinforced, cushion-backed, waxed, and insulated papers; metal foils; plastics; and combinations of these materials. 4 illustrations. R.A.S.

DAY, FREDERICK T. Paper conversion and usage. No. 49. (Part 1). The correct usage of gummed label papers. (Part 2). Labelling with adhesives and plain papers. (Part 3). Heatfix or heatseal labelling papers. (Part 4). Self-adhesive, tacky and split back labelling papers. World's Paper Trade Rev. 139, no. 15: 1118, 1120; no. 17: 1251-2, 1254; no. 19: 1428-9; no. 23: 1732-3 (April 9, 23, May 7, June 4, 1953); *cf.* B.I.P.C. 23: 735-6.

The correct usage of the four principal methods of labeling and sealing are discussed: (1) with the aid of pregummed labeling papers, (2) with adhesives and pastes and plain label papers, (3) with heatfix or heatseal label papers which adhere to a surface by the application of heat and some pressure, and (4) self-adhesive, tacky, or split-back labeling papers which are a permanently activated form of labeling. 6 figures. E.S.

MCLEAN, D. A., BIRDSALL, H. A., and CALBICK, C. J. Microstructure of capacitor paper. Ind. Eng. Chem. 45, no. 7: 1509-15 (July, 1953).

The performance of capacitor paper is an important factor in electronic equipment and is closely related to chemical composition and physical structure. An intimate knowledge of the physical structure has not heretofore existed. A study was made of the physical structure of capacitor paper using the optical and the electron microscopes. Ribbonlike forms predominate in the large particles, which may, for example, be several microns wide and around 0.1 μ thick. Other characteristic structures have been observed and are designated as granular structure, molecular structure, and plastic effect. No relationship was established between the quantity of these structures and the performance of paper in electrical tests; this does not necessarily mean that no correlation exists but that, if it does, its detection would require a much more extensive and quantitative study than was involved in the present work. 1 table, 16 figures, and 17 references. E.S.

SHAND, JAMES. Texture in halftone on uncoated paper. The Penrose Annual 47: 79-80 (1953).

The article is written from the British viewpoint, with particular reference to the shortages of coated paper caused by the enormous demand for printing for the 1951 Festival of Britain and the price increases in accordance with demand; coated papers became almost as expensive as handmade paper. The accurate rendering by letterpress of continuous tone by the halftone process is only possible on the smoothest surfaces of paper; the smoothest surface evolved by paper technicians over the last 50 years is coated paper. Four-color halftone letterpress reproductions are never entirely satisfactory, except when printed on coated paper. However, great strides have been made in the printing of halftone illustrations on uncoated papers during recent years (newsprint, mechanical, supercalendered, imitation art, twin-wire esparto, etc.); the author recommends a less negative attitude toward the possibilities of halftone printing on uncoated papers, particularly for short runs of books and "jobbing printing." Technical developments in presses, inks, and papers should be explored jointly by letterpress printers and graphic designers. E.S.

PATENTS

THE INSTITUTE OF PAPER CHEMISTRY. United States patents on papermaking, first quarter, 1953. Tappi 36, no. 8: 164-9A (August, 1953); *cf.* B.I.P.C. 23: 742.

An annotated list of U. S. patents for the first quarter of 1953 is presented. E.S.

PHOTOMETRY

OSTER, GERALD. Universal high-sensitivity photometer for measuring light scattering, luminescence, transmittance, and reflectance. Anal. Chem. 25, no. 8: 1165-9 (August, 1953).

A high-sensitivity photometer with readily interchangeable optical components was needed in order to carry out a wide variety of accurate photometric measurements on a single instrument. A photometer has been developed employing a photomultiplier tube whose output is amplified by means of an electrometer tube. The instrument is capable of measuring light intensities down to 29 microlamberts. Colored filters, neutral filters, and polarizer may be inserted in various combinations for both the incident and observed beams. The receiver phototube may be rotated about any angle with respect to the incident beam. Cells for liquid samples (including micro quantities) and flat samples have been constructed. The performance of the instrument is illustrated by 12 distinct types of measurements, which include quantitative

measurements of light scattering (turbidity, particle counting, and dissymmetry), luminescence (fluorescence, phosphorescence, and chemiluminescence), transmittance of high absorbance systems, and reflectance goniometry. The instrument is well suited for the measurement of transmittance and reflectance of paper. The results of angular reflection of green light (546 mμ) by a white bond paper are shown graphically. 8 figures and 19 references. E.S.

PHYSICAL TESTING—CELLULOSE—REACTIVITY

BORGIN, KARL. The reactivity of cellulose to acetylation studied by measuring the change of light transmission in the acetylation mixture. Norsk Skogind. 7, no. 7: 210-15 (July, 1953). [In English; Norwegian summary]

In the author's opinion, the reactivity of cellulose to acetylation, a property connected with the chemical kinetics of the process, should be determined only by studying the process itself and not some property of the final product of acetylation. As the cellulose fibers swell and dissolve in the acetylation mixture, the most apparent change that takes place is the change in the optical properties of the solution. A method claimed to measure small differences in the reactivity of rather similar celluloses was developed, which is based on the measurement of the change of light transmission in the mixture during acetylation. It has the advantage that it leaves the acetylation mixture unchanged and does not interfere with the experimental conditions. A special electrical photometer with amplifier, stabilizer, and rectifier was constructed and is described. The acetylations are carried out in a glass cell inside the photometer, and the rate of acetylation is recorded as changes in light transmission *vs.* time. The error of the method is kept below ±5%. Examples of the acetylation of various types of celluloses are given. Cotton linters and sulfite pulp purified by cold alkali treatment are shown to be less reactive than sulfite pulp purified by hot alkali treatment. The high rate of acetylation of some wood celluloses is believed to result from their higher content of reactive amorphous hemicellulose and a favorable fiber structure. Changes in fiber structure which adversely affect the reactivity of the cellulose may be found in the highly refined pulps, although these same pulps may give final products of the highest quality. The average rates of acetylation of different celluloses were determined, and the rate distributions (*cf.* B.I.P.C. 23: 398-9) of the same samples were calculated. When sulfite pulps were fractionated according to fiber length, it was found that the shortest fibers had a very low reactivity, whereas the long fiber fraction was more reactive than the original unfractionated cellulose. The method can also be used to study the acetylation process itself; examples are given which show the influence of the amount of catalyst present or of changes in the pretreatment of the different pulps on the resulting rate of acetylation. 3 tables, 8 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—BRIGHTNESS

BRECHT, WALTER, and WESP, ADAM. Comparison of several instruments for measuring the degree of brightness of papers and pulps. Das Papier 7, no. 13/14: 239-51 (July, 1953). [In German; English and French summaries]

A brief review is given to facilitate the selection of an apparatus for a specific purpose. The principles involved in the following instruments (including appropriate sketches and descriptions) are given: the Zeiss Pulfrich photometer, the Lange instrument, the size tester of Brecht and Liebert (also adapted as a brightness tester), the Photovolt reflection meter, the General

Electric brightness tester, the Zeiss Leukometer; the Hoffmann brightness tester (manufactured by Spindler & Hoyer, Göttingen), the Zeiss-Opton Elko-R brightness tester, and the Zeiss-Opton Elrepho brightness tester. Of these, the two Zeiss-Opton testers are probably the most accurate, whereas such instruments as the Brecht-Liebert apparatus are probably the least accurate. In some cases, however, extreme accuracy is not required. The differences are shown by means of diagrams, some of which also indicate the relationship between cost and accuracy. The influence of the paper surface and color on the brightness is discussed. 18 figures and 9 footnotes. L.E.W.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

WINK, W. A., and VAN DEN AKKER, J. A. A study of the I.P.C. surface bonding strength tester. Progress Report Eight by The Institute of Paper Chemistry, *Appleton, Wis.* Am. Newspaper Publ. Assoc., Tech. Report no. 15: 12 p. (Aug. 13, 1953).

A study of the new rotary-type I.P.C. surface-bonding strength tester (*cf.* B.I.P.C. 21: 258) and instrumental and procedural modifications which have been made since the construction of this instrument are discussed, and data are given which show the influence of a number of variables on the instrumental results. The instrumental and procedural modifications include (*a*) the design and construction of an improved doctoring tool for forming the film of viscous fluid on the film-carrying wheel; (*b*) the conversion of one of the film-carrying wheels to a "driver" to avoid slippage between the sample and film-carrying wheels; (*c*) the installation of a mechanism for automatically lifting the film-carrying wheel from the surface of the sample so as to facilitate the inspection of the film following the test of a specimen; (*d*) the application of a very thin uniform film of Minnesota Mining & Manufacturing Co. trim cement to the rim of the sample wheel to fortify the bond between the double-faced tape and the surface of the wheel; and (*e*) the construction of a rule which reads directly in centimeters/second, the velocity corresponding to the selected end-points. Of the various viscous materials investigated, the polyisobutylenes of different viscosities appear to be the most suitable for the film which produces the tension stress at the surface of the paper. The various procedural techniques and variables include the influence of contaminants, specimen backing, loading of the film-carrying wheel, and thickness of the viscous film. 2 tables, 5 figures, and 3 references.
E.S.

PHYSICAL TESTING—PAPER BAGS

RAGOSSNIG, LUDWIG. Dynamic strength as a general criterion of soda pulp sack paper. World's Paper Trade Rev. 139, no. 21: 1579-80, 1582, 1584, 1589-90, 1592 (May 21, 1953); *cf.* B.I.P.C. 22: 848-9.

This is an English translation of the German original. 1 table and 9 figures.
E.S.

PHYSICAL TESTING—WAX

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Needle penetration of petroleum waxes. Tappi 36, no. 8: 179-80A (August, 1953).

The text of TAPPI Suggested Method T 639 sm-53 (not a TAPPI Standard) is given. The method describes a procedure for the empirical estimation of the consistency of waxes derived from petroleum by measurement of the extent of penetration of a standard needle. The sample is

melted to 30°F. above its melting point and then cooled under controlled conditions to 77°F. The penetration is measured with a penetrometer by means of which a standard needle is applied to the sample for five seconds under a load of 100 grams. 2 figures. E.S.

PIGMENTS

BERNDT, KURT. Titanium dioxide as a pigment for coated paper. Das Papier 7, no. 13/14: 230-5 (July, 1953). [In German; English and French summaries]

The author describes the production of titanium dioxide (I); its physical, chemical, and optical properties; and uses, as compared with those of other pigments employed in paper manufacture. A preliminary test for the detection of the presence of (I) in paper can be made by the use of ultraviolet light, but should then be confirmed by treatment with concentrated sulfuric acid, followed by treatment with 3-6% hydrogen peroxide which gives a yellow-orange-red coloration resulting from titanium trioxide (hydrate). 10 tables and 4 references. L.E.W.

PLASTIC FILMS—TESTING

HU, K. H., and NELSON, A. I. Testing film bags for leaks. Modern Packaging 26, no. 12: 124-5, 177 (August, 1953).

A method is described to determine the leaks both qualitatively and quantitatively in the effectiveness of the sealing operation used on plastic-film containers. Samples of plastic tubing (Visqueen polyethylene bags sealed at three different temperatures and saran bags sealed with an electronic sealer at three different voltages, sealed at conditions requested by the authors, and cellophane and polyethylene bags purchased on the local market) were filled with air of a known pressure and immersed in water. The emergence of air bubbles from the bag was measured on a manometer. The Visqueen polyethylene bags which were sealed at 250 and 280°F. had a seal which lasted longer than the bags themselves; the saran bags showed leaks in the heat-sealing area at very high pressures; the cellophane showed the first leaks at the heat-sealing area; and the polyethylene bags showed leakage at the area where the two sides were folded during the heat sealing. 2 tables, 2 figures, and 5 references. R.A.S.

POLYSACCHARIDES

BARKER, S. A., and BOURNE, E. J. Enzymic synthesis of polysaccharides. Quart. Revs. (London) 7, no. 1: 56-83 (1953).

Various polysaccharides, particularly α-glucosans of the starch and dextran class, and the mechanism of their enzymic synthesis from saccharides are reviewed. 179 references. E.S.

POPLARS

PESSOLANO, VINCENZO. Poplars in the paper industry. Industria carta (Milan) 7, no. 1: 2-7 (January, 1953). [In Italian]

The growing importance of poplars in the Italian pulp and paper industry, improved forestry conditions, important species grown, biological and physical characteristics, the suitability of poplar pulp alone or as admixture to other furnishes, strength properties of papers prepared from poplar pulps, dimensions of fibers, the relationship between green or seasoned wood and ease of cooking or grinding, pulp yields, and practical considerations in the use of the wood for papermaking are discussed. 7 figures. E.S.

RÜNGER, H. G., and KLAUDITZ, W. Relationships between chemical composition and strength properties of the trunkwood of poplars. Holzforschung 7, no. 2/3: 43-58 (1953). [In German; English summary]

The biochemical-mechanical effects of cellulose (I), lignin (II), "pectopolyuronides" (III), and cellulosans (IV) are discussed and, within certain limits, chemical analyses are correlated with the mechanical properties of wood. The chemical composition and the strength properties of springwood taken from individual successive annual rings from certain hybrid poplars were studied in meticulous detail. The chemical data were then correlated as far as possible with specific gravity and strength of the wood samples. The tensile strength of the wood is related to the percentage of (I), and the crushing strength is dependent on the percentage of (II); the over-all effects of (I) and (II) and of tension wood were also considered. Through the deposition of the tertiary layer of the cell wall, tensile strength increases with rising (I) content, and crushing strength drops with decreasing (II). Methods of chemical analysis and mechanical tests are described, and detailed results are given. The effects of (III) and (IV) on strength properties are not entirely clear. Usually the ratio of (III):(IV) was about 1:1. When one- and two-year old poplars (*P. regenerata grandi*) were subjected to mechanical stress during growth, wood in the tension zone (V) showed marked changes in chemical composition, whereas that in the compression zone (VI) appeared almost normal. In (V) the average percentages of (I) and (II) were 59.7 and 16.9 and those in (VI), 41.1 and 25.7, respectively. Wood of two-year old poplars grown normally contained 40.2-40.5% (I) and 24.2-25% (II). The wood of (V) had a much higher tensile strength, but a lower wet tensile strength than that from (VI). Qualitatively similar results were obtained with the green wood of poplar branches. A few data are also given for the wood of three one-year old willows. Further work with other wood species is in progress. 12 tables, 15 figures, and 40 references. L.E.W.

POWER

FRILUND, HARALD. Postwar construction of hydroelectric and steam-power plants in Finland. Paper and Timber (Finland) 35, no. 6: 249-50 (June, 1953); Finnish Paper and Timber 4, no. 5: 63-4 (August, 1953). [In Swedish and English]

Statistical data on the hydroelectric and steam-power plant capacity of Finland and the expansion program now in progress are given. Although the installed hydroelectric capacity has doubled since the armistice in 1944, additional requirements forecast for 1956 prompted the construction of five new plants in northern Finland. This program will probably be completed in 1956, at which time the total installed capacity will amount to 1178 million watt/year. Finland's steam-power plants have undergone considerable modernization after the war. When all equipment now on order will have been installed, the noncondensing power capacity will have been raised to 238 million watt/year and the condensing power capacity to 425 million watt/year. 8 tables. E.S.

PRINTING AND PRINTER'S INK

ANON. Hold the moisture or re-introduce it—is it possible? Printing Equip. Engr. 83, no. 11: 34 (August, 1953).

One inherent disadvantage in heat-set printing involves the excessive amount of moisture being driven out of the paper stock traveling through the driers so that the emerging paper becomes brittle. Paper of higher than usual moisture content, the application of less temperature in drying, and the reintroduction of moisture into the stock after it has passed through both driers have been tried without satisfactory results. The investigation of this problem is recommended. E.S.

ANON. Pictorial printing on corrugated. Modern Packaging 26, no. 12: 98-100, 181 (August, 1953).

A new process has been developed whereby full-color illustrations can be reproduced on corrugated board surfaces; it utilizes a flexographic method adaptable to letterpress or gravure. The method is especially designed to be used on double-faced corrugated liner stock; the best results are obtained with a well-calendered stock of "B" flute, having 50 close-set peaks/foot. Advantages of this color printing in advertising and press requirements for the process are given. 8 illustrations. R.A.S.

BANKS, W. H. A back room view from PATRA. The Penrose Annual 47: 85-7 + 1 plate (1953).

The author discusses the phenomenon of tension in liquids and consequent cavitation and its relationship to certain printing problems, including the behavior of inks or thin litho varnishes in the nip of distributing rollers, the application of a varnish to paper by one roller, the behavior of ink and water films in the nip between inking roller and lithographic plate, ink fly or misting, and printing on nonabsorbent surfaces, such as metal foils. 3 figures. E.S.

KÜHN, WALTHER. The conversion of aluminum foils by intaglio and aniline printing. Verpackungs Rundschau no. 5: 199-201; no. 7; 300-2 (May, July, 1953); Allgem. Papier-Rundschau no. 10: 426-8; no. 12: 522-3 (May 20, June 20, 1953). [In German]

Directions for the printing of aluminum foils used in the packaging industry are given; the odor problem in food packaging is mentioned. E.S.

PULP AND PAPER—IMPURITIES

CHARNELL, HENRY V., JR. Pulp dirt count and evaluation. Tappi 36, no. 8: 128-31A (August, 1953).

A simple routine test which was developed by a pulp mill laboratory and can be run by shift inspectors is described, including apparatus, procedures, key for speck identification, and a dirt-count control chart. Dirt is defined as any foreign matter which is embedded in a sheet and has a marked contrasting color to the rest of the sheet when viewed by transmitted light. The examination of series of results by accepted statistical procedures indicated that single dirt-count values must be accepted with great caution; in normal operation, the mill averages its tests in groups of five, although larger groups would be more satisfactory. The method is considered a realistic approach to the problem, although the challenge to develop better procedures still exists. 3 tables, 2 figures, and 4 references. E.S.

MURTO, JAAKKO O. The screening of sulfite pulp. Paper and Timber (Finland) 35, no. 5: 229-32 (May, 1953). [In Finnish; English summary]

The results of laboratory and some mill-scale experiments on the bleaching of unbleached sulfite pulp at the Finnish Central Research Institute are described. The fundamentals of screening are discussed with particular reference to the origin of the impurities, the factors which influence their separation from the pulp, and the influence of log barking on the cleanliness of the pulp. The laboratory experiments indicate that the efficient removal of the knots during coarse screening will eliminate the need for fine screening, particularly if the pulp will be bleached and screened after bleaching. 1 table. E.S.

PULP WASHING

VON HILDEBRANDT, PAUL G. Removal of cooking liquor and washing of chemical pulp by the Von Hildebrandt continuous process. Paper Trade J. 137, no. 4: 20-1; correction: no. 5: 10 (July 24, 31, 1953).

A continuous process claimed to be applicable to all chemical pulping procedures, including semichemical pulping, involves a special blow tank in which 85-90% of the spent liquor is removed without dilution. The pulp then passes through a defiberizer and press-roll section—where uncooked chips and knots are fiberized and more liquor is extracted from the pulp—and finally through a four-stage, countercurrent, screw-conveyor washing system. The liquor is never cooled below 200°F. before reaching the evaporators. 1 illustration. E.S.

RADIOACTIVITY

FULLER, EDWARD C. Atomic power. Tappi 36, no. 8: 146-8A (August, 1953).

The author discusses the technical problems involved in using nuclear fuels to generate steam. E.S.

MILL & FACTORY. The use of radioactive isotopes by industry. Mill & Factory 53, no. 2: 75-9 (August, 1953).

In an enumeration of some of the uses of radioactive isotopes in industry, the five transmission-type gages used by the Carborundum Company to improve quality control in the manufacture of abrasive paper are included. The advantages of using radiation for measuring thickness or weight/unit area are that measurement is continuous and production need not be interrupted and that even the most delicate products are unmarred by the method. 13 figures. R.A.S.

RAYON—VISCOSE PROCESS

BARTUNEK, RICHARD, and JANCKE, WILLI. Studies on the structure of native cellulose fibers. Part I. Technological observations and analytical methods of the viscose industry. Holzforschung 7, no. 2/3: 71-8 (1953). [In German; English summary]

Using the structural differences of spruce sulfite pulp (I) and beech sulfite pulp (II) as examples, attempts have been made to detect differences by means of fully described analytical methods, which include swelling measurements (made microscopically), the determination of optical concentrations of sodium hydroxide required for mercerization, the determination of the percentage of pulp fibers resistant to xanthation, and the determination of xanthate solubility. (II) swells far less, but more uniformly than does (I). In the case of (II), the necessary increase in the concentration of steeping liquors was gaged by determining the optimum concentrations of the mercerizing baths. Depending on the type of pulp used, these optima ranged from 13.25-14.75% sodium hydroxide. The amount of carbon disulfide required to insure the best sulfidizing action depended on the average D.P. of the pulp as well as on the pretreatment of the fibers. This orienting study forms the basis for future systematic studies on pulps of various origins and should indicate which properties are due to the inherent structure and composition of the fibers and which must be ascribed to the effects of pulping, bleaching, and to further purification. 7 tables, 5 figures, and 5 references. L.E.W.

PERILÄ, OLAVI. The effect of cooking conditions of dissolving-grade sulfite pulps from birch on their suitability for the manufacture of viscose. Paper and Timber (Finland) 35, no. 4a: 139-52, 154 (Special issue, April, 1953). [In Finnish; English summary]

Following a review of the literature on the effect of pulp characteristics on the filtering properties of viscose and the quality of viscose-rayon fibers made from it, the author describes first the effect of cooking conditions of birch sulfite pulp on its suitability for viscose manufacture. The maximum cooking temperature and the sulfur dioxide and lime contents were used as variables. A reduction of the cooking period becomes possible by an increase in cooking temperature or in the total sulfur dioxide content of the cooking acid and pressure, or by a decrease of the lime in the cooking acid, all other conditions remaining constant. The first two of these alternatives are to be preferred, because the yield of α-cellulose and the pulp characteristics remain approximately the same; the filtering properties of the viscose prepared from these pulps improve, and the reactivity of the pulp increases. With a higher sulfur dioxide content of the cooking acid, both the yield of α-cellulose and the α-cellulose content in the pulp increase, whereas the pentosan content decreases. A decrease in the lime content of the cooking acid results likewise in an increase in the α-cellulose content of the pulp, a decrease in pentosans, and an improvement in the reactivity and filtering properties of the resulting viscose; however an appreciable decrease in the yield of α-cellulose takes place at the same time. Birchwood attacked by the black tinder fungus (I) was investigated with regard to its effects on the dissolving pulp. Small quantities of birchwood decayed by (I) did not have an appreciable effect on the pulp; however, if large quantities of decayed wood were used, particularly if the decay was at an advanced stage, the filtering properties of the viscose were impaired, although the reactivity of the pulp increased. The yield of α-cellulose and the α-cellulose content of the pulp decrease simultaneously. The bleaching of the pulp also becomes more difficult, since decayed wood requires more chlorine. In studies on the effect of temperature in the hot alkaline extraction stage of pulp bleaching, the yield of α-cellulose was found to be independent of the temperature of the treatment, whereas the α-cellulose content of the pulp increases—provided sufficient alkali is present—the pentosan content decreases, and the filtering properties of the viscose improve at higher temperatures. In conclusion, an account is given of the changes in the properties of the viscose resulting from the removal of the short-fibered fraction (II) from the pulp. When this takes place prior to bleaching, all procedures are greatly facilitated. The chlorine requirements decreased from 1.2 to 0.2% of the weight of the pulp, when 12.6% of (II) was removed. The reactivity of the pulp and the filtering properties of the viscose improved at the same time. The α-cellulose content of the pulp increases, whereas the amounts of pentosans, resin, fat, wax, and ash decrease. The quantity of pentosans present in the α-cellulose decreases if the total sulfur dioxide content of the cooking acid increases or its lime content decreases, if the temperature of the hot alkaline extraction bleaching stage increases, or (II) is removed. The use of decayed wood, on the other hand, increases the pentosans. The degree of oxidation of the pulp decreases when the temperature of the alkaline extraction rises and (II) is removed. The polymolecularity of the cellulose can be decreased by increasing the temperature of the hot alkaline extraction; it is also lower in pulp prepared from decayed wood than in that from sound wood. Decayed wood increases the ash content of the pulp, although the quantity of inorganic substances can be reduced by the removal of (II). The turbidity of viscose prepared from birch pulp can be improved considerably when (II) is removed from the pulp. 10 tables and 69 references. E.S.

RESEARCH

JENNESS, LYLE C. Research day at University of Maine. Paper Trade J. 136, no. 23: 12-14, 16-17 (June 5, 1953); Paper Mill News 76, no. 38: 56, 58, 60, 120 (Sept. 19, 1953); Pulp Paper Mag. Can. 54, no. 8: 135-7 (July, 1953).

Abstracts of some of the papers presented at the technical session of the Research Day Program at the University of Maine are given. Authors and titles of the various papers are: Beamesderfer, John W. Why study surface properties of paper materials; Colter, John S. Use of recovered ammonia in sulphite pulping; Todd, Frank H., and Story, Harold E. Stretch modulus of paper under rapid loading; Cooper, Stuart R. Ammonia recovery from sulphite waste liquor; Howell, Charles M., and Cunningham, Eugene L. Effect of chip dimensions on penetration of ammonia-base cooking acid; Snow, Harold E. Recent work on evaporator coefficients in the concentration of waste liquor; Jenness, Lyle C. Contributions of the University of Maine to unit operations research; Thode, Edward F. Surface area of pulp fibers; Jenness, Lyle C. Background and work of Maine staff on pulping research; and Thode, Edward F. Effect of dye structure on dye adsorption on pulp fibers—a progress report. The third reference includes four of the previous papers. 1 table in the first and second references and 4 illustrations in the second. R.A.S.

RESEARCH LABORATORIES

BERGEK, TRYGGVE. The development of Swedish forest products research. Svensk Papperstidn. 56, no. 14: 531-7 (July, 1953). [In English]

Following a brief introduction on the beginnings of technical (particularly co-operative) research in the Swedish pulp and paper industry, the activities and facilities of the Swedish Forest Products Research Laboratory in Stockholm, the Institute for Physical Chemistry at Uppsala, the Royal Institute of Technology in Stockholm, Chalmers Institute of Technology in Göteborg, and the industrial research laboratories of Stora Kopparbergs Bergslags Aktiebolag at Falun, Uddeholms Aktiebolag at Skoghall, Mo- och Domsjö Aktiebolag at Alfredshem, Kramfors Aktiebolag at Sundsvall, Svenska Cellulosa Aktiebolag at Kubikenborg, Billeruds Aktiebolag at Säffle, and Bergvik-Ala Nya Aktiebolag at Sandarne (specialists in tall oil research) are described. In conclusion, the world-wide problem of insufficient scientific manpower is mentioned; this problem exists also in Sweden, and the principal task of Swedish cellulose research for years to come is not an enlargement of the material resources for research work, but the training of an adequate supply of qualified research workers. 12 illustrations. E.S.

JENSEN, WALDEMAR. The activities at the Institute of Wood Chemistry at Åbo Akademi during 1952-53. Paper and Timber (Finland) 35, no. 4a: 155-6 (Special issue, April, 1953). [In Swedish; English summary] *cf.* B.I.P.C. 22: 853.

The activities of the institute, including research on the suitability of birchwood as a pulpwood, the chemical composition of domestic rosins and their suitability as a paper size, the chemical composition of suberin in birch bark, and the higher boiling fractions of sulfite fusel oil are reviewed briefly. 1 table. E.S.

RESIN, SYNTHETIC

WILLIAMS, A. E. Silicones in the paper industry. (Part I). Treatment of building fabrics and exposed surfaces. (Part II). Application as lubricants, fluids and anti-foam agents. World's

Paper Trade Rev. 139, no. 21: 1559-60, 1562, 1564, 1566; no. 22: 1655-6, 1658, 1663 (May 21, 28, 1953).

Although silicones were first made in England by Kipping of the University of Nottingham on a laboratory scale, the Dow Corning Corp. of Midland, Mich. was the first to manufacture them on a large scale. As sales in Britain began to increase, a new English company, Midland Silicones Ltd., was formed and the manufacture of silicones in Great Britain started. A description of some of the many applications of silicones, particularly those of interest to the paper industry, is given. In the first part of the article the protection of masonry and metal work is discussed; the second part deals with the use of silicones as lubricants, antifoaming agents, and in rubber (silicone rubber or Silastic). 6 figures. E.S.

RUBBER, SYNTHETIC

CLINEBELL, BETTY JO, and STRAKA, LEORA A. Engineering developments of rubber, 1951-1952. Mech. Eng. 75, no. 8: 632-8, 646 (August, 1953).

A review of developments in rubber for the indicated period is given under the headings: cold rubber, oil-extended rubber, Hypalon, Alfin polymers, other types of rubber, cellular rubber, latex, reclaimed rubber, adhesion, mechanical goods, tires, compounding, testing, and ozone degradation. 139 references. R.A.S.

SAFETY

COTTS, GERHARD K. The psychology of industrial accidents. Paper Ind. 35, no. 5: 556-7 (August, 1953); Can. Pulp Paper Ind. 6, no. 7: 12-13 (July, 1953).

Following a brief discussion of habitual or temporary accident proneness, the author analyzes the misinterpretation of safety instructions based on inadequate communication. Improvement of communication is obtained by learning more about what is going on between oneself and the other person, and to bring into one's mind and, if necessary, into occasional discussion, the emotional events and problems between the people in an organization. The awareness and acceptance of the humanness of industry will improve industrial relations in many desirable ways. E.S.

[KIDD, J. D.] Prevention of accidents in papermills. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 1: 17-24; discussion: 25-32 (February, 1953).

The 1952 agreement prepared by the Joint Standing Committee on Prevention of Accidents in Paper Mills is reviewed; beginning August 1, 1952, the old 1937 agreement is revoked and replaced by the present one. Details of the new agreement are given. E.S.

SEMI-CHEMICAL PULPING PROCESS

FIELD, H. L. Semichemical pulping of hardwoods. Tappi 36, no. 8: 140-3A (August, 1953).

The author discusses details of the neutral sulfite semichemical process which is particularly adaptable to the pulping of hardwood species of low and medium lignin content (poplar, aspen, beech, birch, maple, southern gum, and some oaks). Barking, chip requirements, penetration, cooking for bleached and unbleached pulp, handling of the chips between digester and fiberizer, fiberizing equipment and operation, washing, screening, bleaching, and recovery are considered. E.S.

SETUP BOXES

AMERICAN BOXMAKER. Production flow in a three-story plant. Am. Boxmaker 42, no. 8: 14-15 (August, 1953).

First in a series of articles on boxmaker production lines, the setup-box-making activities of the Kroeck Paper Box Co.'s plant in Chicago are traced. The flow of materials in the process of manufacturing raw stock into finished boxes from floor to floor and through the mechanical operations is shown diagrammatically. 8 figures. R.A.S.

SHIPPING CONTAINERS

WALDORF PAPER PRODUCTS COMPANY, *St. Paul, Minn.* Waldorf Pull-Tab box. Fibre Containers 38, no. 7: 110 (July, 1953).

The Pull-Tab box for easy opening uses no reinforced strip or tape; instead the inner liner of the corrugated box is slit to define a ribbon as it tears. Although slit across the corrugations, the corrugating medium is not impaired, and the container retains its basic strength. The device can be adapted to stitched, taped, or glued manufacturers joints. Shipments in Pull-Tab containers are permitted by application to the Official Classification Committee under Rule 49. 4 illustrations. E.S.

SHIPPING CONTAINERS—FIBER DRUMS

DELAWARE BARREL AND DRUM COMPANY, *Wilmington, Del.* Plastic 'drum' undergoing tests. Packaging Parade 21, no. 247: 98-100 (August, 1953).

The company is testing a new container, a molded polyethylene drum used with an outer container (usually a steel drum but also plywood, fiber, or corrugated board) for the packaging of acids. Use of these drums rather than glass carboys should ease problems of space and filling operations, since one container can replace four of the glass carboys; when encased in a steel drum, the container can be rolled and palletized. The company has made every effort to construct the container with the same measurements as regulation steel drums so that existing equipment can be interchanged with standard outer containers and standard closures. 8 illustrations. R.A.S.

SLIME PREVENTION

UNITED STATES MOVIDYN CORPORATION, *Chicago.* Effective slime control with colloidal silver. Paper Ind. 35, no. 4: 459 (July, 1953); Paper Trade J. 137, no. 1: 33 (July 3, 1953); Paper Mill News 76, no. 24: 22 (June 13, 1953). Clarification. Paper Mill News 76, no. 32: 24 (Aug. 8, 1953).

The use of a new formulation "A-36," containing Movidyn (a colloidal silver suspension), which was developed by Z. V. Moudry, and its effectiveness as a slime-controlling agent are described briefly. 1 illustration in the first reference. E.S.

SPECIFICATIONS

WALLACE, DOUGLAS. Packaging material specifications for high-speed automatic machines. Tappi 36, no. 8: 136-9A (August, 1953).

The author describes the specifications for cartons and corrugated shipping containers for high-speed operation which Procter & Gamble issues to its

suppliers. An effort is made to specify performance wherever possible; the importance of uniformity within the material from one supplier and uniformity between the materials from several suppliers (irrespective of the equipment they use) is stressed. The engineers have been able to build high-speed machines that will run uniform cartons; however, these machines will not run cartons that are not uniform. In the case of cartons the important items covered by the specifications include exact size, thickness on edges and glue seam, stacking properties, ink bleed, prebreaking, grain direction, location of printed and unprinted panels, type of product to be packed (solids, granules, or powder), type of filling machine and opening device, location of any special cutouts, and packing of the empty cartons, and for the board; strength, sealability (as determined by ink absorption and water-drop test), ink rub, heat resistance of inks, and slipperiness of printed surface (depending on the printing process and amount of offset spray applied). For the corrugated shipping containers size, scoring, bending properties of the flaps, manufacturer's joint, sealing properties, and packing of containers are specified. E.S.

STARCH

HUSEMANN, E., and BARTL, H. Macromolecular compounds. [382] The size and shape of the amylose molecule. Makromol. Chem. 10, no. 2: 183-4 (July, 1953). [In German] *cf.* B.I.P.C. 24: 10.

When investigating the acetates and nitrates of amylose and amylopectin from potato starch, it was found that the D.P. of amylose acetate (D.P. 190) was lower than that of amylopectin (540) but, when the corresponding nitrates were compared, the amylose nitrate had a higher D.P. (640) than amylopectin nitrate (300). Furthermore, the Staudinger viscosity constants ($K_m \times 10^4$) for the amylopectin and amylose acetates were 1.0 and 3.47, respectively, but were 0.68 and 0.65 for the corresponding nitrates. It was found that amylose is very sensitive to degradation while in solution; this explains the differences found in D.P. Native amylose is believed to exist as a stretched-out molecule which contracts when placed in solution to an extent depending upon the electrolyte content. When acetylated, the amylose molecule is stretched if more than 2.5 acetyl groups/glucose unit are introduced. At the point of stretching the viscosity constant rises sharply. Nitration is not able to stretch the amylose molecule, and the viscosity is always low. The amylose molecule therefore possesses a changeable molecular shape, and no clear relationship exists between the viscosity constant and the D.P. 3 tables and 5 references. J.W.S.

ULMANN, M. Chromatographic investigations of acid hydrolyzates of potato starch. 1. Makromol. Chem. 10, no. 2: 147-57 (July, 1953). [In German; English summary]

Acid hydrolysis of potato starch and starch fractions was studied by selective adsorption of the degradation products on columns of alumina. The upper part of the column which was made slightly acid (pH 4.5) sorbed the amylopectin fractions, whereas the lower alkaline part (pH 8.2) sorbed the amylose fractions. It was shown that the amylopection fraction of potato starch is much more sensitive to acid treatment than the amylose fraction. Amylose was only slightly affected by acid until most of the amylopectin had been extensively disaggregated and hydrolyzed. Similarly, upon enzymatic hydrolysis of starch with a diastase preparation, the amylopectin fraction hydrolyzed very rapidly, whereas the amylose fraction was comparatively resistant. 2 tables, 1 diagram, and 12 footnotes. J.W.S.

STATISTICAL METHODS

NOBLE, CARL E. The role of statistical methods in the modern quality control program. Paper Trade J. 137, no. 2: 21-2, 24 (July 10, 1953).

The author attempts to present the steps which should be taken in establishing a modern quality control program. These steps involve the establishment of: (*a*) significant and reliable quantitative measures of product quality, (*b*) realistic specifications which take into account customer needs, manufacturing capabilities, and costs, (*c*) a raw-materials inspection program, (*d*) a system of controlling quality during the manufacturing operations, and (*e*) an agency independent of the manufacturing department to measure and report to top management the degree to which the finished product is meeting customer requirements. The role of statistical methods in this quality control program is described. 3 tables and 5 references. E.S.

STORAGE BATTERIES

GOULD-NATIONAL BATTERIES. How to use a carbon arc burner in battery repair. Paper Trade J. 137, no. 1: 23-4 (July 3, 1953).

Lead burning or welding in battery maintenance may be done with an acetylene and oxygen torch or with a carbon burner. The latter uses electrical power from the battery being repaired and involves simple equipment. Instructions for the correct application of the method are given. 2 illustrations. E.S.

STRAW

JAYME, GEORG, and SCHEURING, LUDWIG. Acetate pulps from cereal straw. I. The influence of prehydrolysis, sulfate digestion, bleaching, and purification. Das Papier 7, no. 13/14: 223-30 (July, 1953). [In German; English and French summaries]

Details are given for prehydrolyzing and kraft cooking of rye and wheat straw, and for subsequent (multistage) bleaching (with hot sodium hydroxide treatment as the second stage). These bleached pulps (obtained in 30% yield) could be acetylated easily but gave hazy solutions. When, however, the bleaching stages were followed by treatment with cold 10% and hot 10% sodium hydroxide solutions, acetates were obtained which, in solution, showed a clarity similar to that of acetates prepared from cotton linters. Similar results could not be obtained by simply modifying prehydrolysis or cooking conditions. The most satisfactory rye straw acetate pulp (obtained in 27.6% yield; barytes brightness 89.1%) contained 98.5% α-cellulose, yielded 0.96% furfural, contained 0.21% ash, and after acetylation and centrifuging showed a turbidity value of 0.0058. 7 tables and 43 references. L.E.W.

PORPHYRE, J.-A. Straw again! Papeterie 75, no. 6: 403, 405 (June, 1953). [In French]

With reference to the article by Tabb (*cf.* B.I.P.C. 23: 583), the author furnishes supplementary remarks to explain why a straw-pulp industry has never been developed in France. Any attempts for starting a straw-pulp mill have been suppressed by the official statement that not sufficient straw is available in France for this purpose to feed a unit making 100 tons of pulp/day, a size considered essential for being economically feasible. The author's opinion is that smaller integrated units would have a much better chance for success. A number of old French and English patents (since 1888) are reviewed in which the use of straw for the manufacture of explosives and smokeless powder is covered to show that straw has been considered for chemical applications for a long time. 6 references. E.S.

TABB, C. B. Strawpulp. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 1: 89-98; discussion: 99-100 (February, 1953).

The papermaking behavior of bleached straw pulp, the properties it imparts to papers, and its principal applications are discussed. By the addition of straw pulp the quality of most papers normally made from bleached wood pulp can be improved in surface properties, strength, and handle, often with a saving of beating power. Assuming that the demand for straw pulp will increase, the prospects of greater production in Britain are discussed. A comparison is made with Holland where more pulp is made from a smaller straw production. There are no technical obstacles in the way of expansion in Britain, although inland developments are largely precluded by effluent problems. However, Britain's long coastline offers alternative sites. 3 tables and 3 references. E.S.

STREAM POLLUTION

HORLOCK, A. B., ISABELL, R. D., and JOBIN, R. S. Recent developments in the treatment of pulp and papermill effluents. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 1: 47-58; discussion: 59-62 (February, 1953); World's Paper Trade Rev. 139, no. 25: 1887-8, 1890, 1892, 1894, 1899-900 (June 18, 1953).

Developments resulting from the passing of the River Boards Act, 1948 and the Rivers (Prevention of Pollution) Act, 1951 are discussed, with particular reference to standards which river boards may prescribe for effluent quality. When effluent disposal is introduced, it is important to have available sufficient data to evaluate the problem accurately and to reduce losses at their source. Research has indicated that pulp- and paper-mill effluents are amenable to biological treatment, and examples are given of the application of such methods to esparto, straw, and rag pulping, deinking, and paperboard-mill wastes. Recent trends are toward the development of high-rate treatment methods for both suspended solids and B.O.D. removal. 1 figure and 27 references. E.S.

SULFATE MILLS

CANADIAN PULP AND PAPER INDUSTRY. Expansion at the Harmac sulphate plant. Can. Pulp Paper Ind. 6, no. 8: 14 (August, 1953); *cf.* B.I.P.C. 22: 51.

The additions involved in the expansion program of the Harmac sulfate mill at Nanaimo, Vancouver Island will increase the mill's capacity from 280 to approximately 600 tons/day; the plant will continue to specialize in bleached sulfate pulp, using principally salvage materials from the company's logging and converting operations. The recovery units and the new bleach plant should be completed by September 15. 2 illustrations. E.S.

SULFITE PROCESS—AMMONIA BASE

LAFOND, L. A. Ammonia versus calcium in acid making, cooking, and screening. Tappi 36, no. 8: 131-2A (August, 1953).

Following a 3.5 years' operating period with ammonia-base sulfite liquor (I) at the Lebanon, Ore. mill of Crown Zellerbach, the following comparison in cost and operating experience is made. (I) doubled the cost over calcium-base liquor, but resulted in more uniform acid-plant and digester-house operation, a saving of about 40 lb. of sulfur/ton of pulp, increased pulp yield, increased production on account of shorter cooking cycles, an

easier-screening pulp with a decrease in the percentage of screenings, and less maintenance. One problem which was not anticipated is the rapid growth of slime because of the higher nitrogen content. E.S.

SULFITE WASTE LIQUOR

JENSEN, WALDEMAR, RINNE, PEKKA, and VAINIO, MAURI. Investigation of the fusel oil obtained in the production of alcohol from spent sulfite liquor. III. Paper and Timber (Finland) 35, no. 4a: 135-8 (Special issue, April, 1953). [In Swedish; English summary] *cf.* B.I.P.C. 22: 861.

Jensen (*cf.* B.I.P.C. 21: 353) previously observed a new fusel oil fraction (I) boiling at 129°C. at 15 mm. of mercury; *n*-propylguaiacol was shown to be the principal constituent. Jensen and Rinne (*cf.* Part II) detected (I) only in one of the 15 samples of fusel oil from Finnish spent sulfite liquors. (I) has now been further investigated and found to contain 15-20% of its weight of eugenol (II). A third phenolic substance (so far not identified) may also be present in (I). This is indicated by the paper chromatogram produced according to the method of Hossfeld (*cf.* B.I.P.C. 21: 460). The presence of (II) was also established by distillation in a spinning-band column after (I) had been subjected to alkali fusion. *cis*- and *trans*-Isoeugenol were formed, which is a further evidence of the presence of (II) in (I). (II) was finally isolated from (I) by the method of Waterman and Priester (*cf.* Rec. trav. chim. 48: 1278-9 [1929]); the isolated (II) was identified by its 3,5-dinitrobenzoate. 1 table, 2 figures, and 11 references. E.S.

SURFACE AREA

ERGUN, SABRI, and OWEN, JACK. Determination of size distribution of macropores in porous materials. Anal. Chem. 25, no. 8: 1222-6 (August, 1953); *cf.* B.I.P.C. 22: 530-1.

The size stability and reactive, catalytic, and sorptive properties of porous materials appear to be related to their pore structure. A better understanding of the relation of some of these properties to pore structure may prove to be of practical as well as of theoretical importance. Relatively simple but sound methods, however, are essential in the analysis of pore-size distribution. A method has been developed for the analysis of size distribution of macropores in porous materials from the measurements of aerodynamic densities of various size fractions by the gas-flow method. Aerodynamically determined specific particle volumes are plotted as a function of particle size. The resulting curve and its derivative are employed in the analysis of pore-size distribution and in the estimation of surface areas of macropores. Macropores constitute 73 to 81% of the total pore volume in metallurgical cokes. Experiments indicated that they are distributed at discrete size levels. Calculated surface areas of macropores are in good agreement with data reported in the literature. The method is novel and no arbitrary or empirical constants are employed in the calculations. 4 tables, 10 figures, and 7 references. E.S.

PAYNE, D. A method for the determination of the approximate surface areas of particulate solids. Nature 172, no. 4371: 261 (Aug. 8, 1953).

The author has devised a method for the determination of the approximate surface area of particles which involves the determination of the relationship between moisture content and suction pressure. A description of a simple apparatus is given together with data for glass spheres of known surface areas from 180-1500 sq. cm./gram. 1 table and 3 references. W.L.I.

TALL OIL

GRIFFIN, ARCHER E. New developments in tall oil. Paper Trade J. 137, no. 1: 20-2 (July 3, 1953).

The author reviews recent developments in the refining of tall oil, separation of the rosin and fatty acids, and its application in soaps, emulsions, protective coatings, and the drying oil field (limed tall oils and tall oil esters). New actual and potential uses of tall oil are being uncovered by continued research, and the future of the material is promising. E.S.

TENSION WOOD

JAYME, GEORG, and HARDERS-STEINHÄUSER, MARIANNE. Tension wood and its effects on poplar and willow wood. Holzforschung 7, no. 2/3: 39-43 (1953). [In German; English summary]

In wood sections tension wood (I) is stained bluish-violet with zinc chloroiodide, especially in the cell lumina, whereas normal wood (II) is stained brown. (I) from poplar contains more cellulose, less lignin, and less pentosans than does (II). A sample of *Populus trichocarpa* containing 71% (I) gave 65.1% kraft pulp, and in a sample of (II) from *Populus generosa* the yield was 52%, whereas it amounted to 59.8% in the case of (I) from the same species. Thus a satisfactory evaluation of pulpwoods is difficult unless the percentage of (I) is known. Although (I) is desirable from the standpoint of yield, most normal pulping operations when applied to (I) are too drastic, and invariably the breaking length, fold, burst, and internal tear of sheets made from (I) pulps are lower than those made from (II) of the same wood. The basis weight of pulps from (I) as well as the brightness of the unbleached pulp is higher than that from (II). Pulps from (I) hydrate more slowly than do those from (II). Pulps from poplar (I) are well suited for dissolving pulps. The physical properties of wood are strongly influenced by the presence of (I). Specific gravity and shrinkage, especially in the longitudinal direction, increase with increasing (I), and its different hardness and toughness may lead to difficulties on mechanical separation, for instance in cutting veneers. Willow-wood data are reserved for a future paper. 3 tables, 4 figures, and 10 references. L.E.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

ANON. Chemicals against fire. Du Pont Mag. 47, no. 4: 12-13 (August-September, 1953).

A brief report on two flame retardants for protecting cloth and paper is presented. A renewable type, temporarily labeled X-12, can be applied from an aqueous solution to finished goods or unfinished cloth or paper in one quick step without special equipment. The durable Erifon flame retardant is applied to cloth in a continuous process; it is not suitable for treating finished articles. Erifon-treated fabrics have withstood as many as 50 launderings or dry cleanings. 2 illustrations. E.S.

VA-PURGE PROCESS

PULP AND PAPER RESEARCH INSTITUTE OF CANADA. The Va-Purge process in chemical pulping; a symposium. Pulp Paper Mag. Can. 54, no. 8: 98-125; discussion: 126-34 (July, 1953); Paper Ind. 35, no. 4: 450-8 (July, 1953). [Abridgment]

"Va-Purge" is the trade name for a pretreatment process patented by the Institute (U. S. patent 2,640,774, granted June 2, 1953 to Ross, Hart, Strapp, and Maass; *cf.* B.I.P.C. 23: 854). It derives its name from the use of steam

to purge or remove air from fibrous cellulosic material prior to cooking. The advantages center around improved penetration of the cooking liquor brought into contact with the fibrous material after it has been "purged." The process may be described briefly as follows. The principal steps, following charging of a pressure vessel with fibrous cellulosic material are: *Purging cycle.* This consists of a rapid build-up of pressure with steam to a predetermined level; the pressure may be held at this level for a short period and is then released rapidly to a predetermined lower level; this sequence may be repeated several times. *Liquor charging.* After purging, sufficient cooking liquor is admitted to submerge the charge; this may be done at or above atmospheric pressure. *Penetration cycle.* After charging with liquor, the total charge is brought up to some predetermined pressure and held there for a predetermined period; additional liquor is introduced to maintain the liquid level above the fibrous charge. An additional step, prior to purging, is "atmospheric presteaming," where the large volumes of air between the chips are removed; although this step is considered unnecessary to the successful operation of Va-Purge, it is nevertheless considered desirable by the proponents of the process. D.H.

The authors and titles of the individual papers of this symposium are: Maass, Otto. The problem of penetration, p. 98-103—3 diagrams; Ross, James H. The Va-Purge impregnation pre-treatment: one solution to the penetration problem, p. 103-5 (Paper Ind., p. 450-1)—2 figures; Hart, John S., and Strapp, R. K. Adaptation of Va-Purge to chemical pulping with conventional equipment, p. 105-10 (Paper Ind., p. 452-4)—3 figures; Edwards, R. R. Use of the Va-Purge principle in sulphite pulping at Ocean Falls, B.C., p. 110-11; Palm, W. H., and Ostrowski, Henry J. Use of the Va-Purge process in straw pulping for corrugating board manufacture, p. 111-16—1 table, 9 figures, and 1 reference (Paper Ind., p. 455-7—1 table and 5 figures); Ostrowski, Henry J. Initial investigations of the Va-Purge process for straw pulping, p. 117-18—3 tables; Houghton, T. W. Increase of yield and quality over conventional kraft cooking by the use of Va-Purge, p. 118-19—1 diagram; Hartford, W. G. Va-Purge and the alkaline pulping of mixed hardwoods, p. 119-20; Wilson, E. G. Mill trials of Va-Purge in conventional kraft cooking equipment, p. 120-1; Beath, L. R. Trials with the Va-Purge process at the Riverbend mill, p. 121-2; Keswick, R. J. P. Use of Va-Purge/vapour-phase technique with mill equipment, p. 122-3—1 diagram; Strapp, R. K. Applicability of Va-Purge to continuous pulping, p. 124-5—2 figures (Paper Ind., p. 458—1 figure); and (in discussion) Howard, E. J. Prepared statement, p. 126-7. In addition the following reviews about the Va-Purge process and the symposium appeared in: Paper Trade J. 136, no. 24: 19-21 (June 12, 1953)—1 figure; Can. Pulp Paper Ind. 6, no. 7: 8-9 (July, 1953); Pulp & Paper 27, no. 7: 32, 34-5 (July, 1953)—3 diagrams; Can. Chem. Processing 37, no. 7: 46, 48 (June 20, 1953)—2 diagrams; Paper-Maker (London) 126, no. 2: 100, 107 (August, 1953); and World's Paper Trade Rev. 140, no. 1: 11-12 (July 2, 1953). E.S.

WASTE LIQUOR

HARWOOD, J. H. Trade effluent treatment with Aluminoferric. Ind. Chemist 29, no. 342: 315-23 (July, 1953).

The author discusses the treatment of industrial effluents, the types of equipment used, and the results obtained with the coagulant Aluminoferric (aluminum sulfate) on numerous types of trade wastes, including paper-mill wastes. Normal paper-mill waste is acid, that from straw and rope treatment is slightly alkaline. The effluent should be adjusted fairly close to neutral for most satisfactory results. A mixture of sodium aluminate and Aluminoferric has been very successful, yielding an excellent effluent. 5 tables, 5 figures, and 17 references. E.S.

SCHOLZ, WERNER. Waste liquor purification in paper and pulp mills by means of humic acid. Das Papier 7, no. 13/14: 255-7 (July, 1953); Paper-Maker (London) 126, no. 3: 192, 194, 200 (September, 1953). [In German; English and French summaries. Complete English translation].

A new humic acid preparation in the form of dry flocs (developed by the Dutch chemist Knepper and available under the name "Daqua," not further described) possesses marked superiority over the older alkaline humates. The following advantages are claimed for the "Humin" process: applicability at a pH range of 8 to 4.5; lowered use of inexpensive chemicals; rapid sedimentation even of slimy substances, so that small settling tanks are required; extensive biological purification of waste liquors which can be largely re-used; recovery of white water; and low cost of first installation. 1 reference. L.E.W.

WASTE PAPER

MORRIS, JAMES C. Wastepaper quality for folding boxboard. Fibre Containers 38, no. 7: 94, 96, 99-100 (July, 1953).

Following a brief description of the manufacture of folding boxboard consisting of a sheet in six to eight layers prepared from four different furnishes (one top liner of virgin pulp and hard whites, one underliner of pulp substitutes, one back liner of news, and two to four filler layers of mixed waste papers), the quality requirements of the waste paper are summarized under the three principal points: cleanliness, uniformity of fiber, and uniformity of brightness. Specific examples of contamination and their effect on quality are mentioned, with particular reference to asphalt (the worst offender), wax, wet-strength papers, and dirt in general. In addition, the quality of baling is an important factor in mill operations. Northern jute mills are faced with severe competition from giant southern mills converting bleached pine kraft pulps into folding boxboard; waste-paper dealers and users must co-operate to improve quality and keep prices stable so that the northern mills remain in a competitive position. E.S.

WATER-MARKS

ANON. The advertising power of watermarks for the printer. Allgem. Papier-Rundschau no. 10: 415-16 (May 20, 1953). [In German]

The advantages for the printer who handles watermarked paper in attracting and keeping customers are outlined. E.S.

WAXES

ERNST SCHLIEMANN'S EXPORT-CERESIN-FABRIK, *Hamburg.* Mineral waxes for packaging. Allgem. Papier-Rundschau no. 10: 424-5 (May 20, 1953); Verpackungs Rundschau no. 5: 211-13 (May, 1953). [In German]

The possibilities of microcrystalline waxes in the packaging industry are described. E.S.

WHITE WATER

ANON. Chesapeake Paper Board Co. installs OCO water system. Fibre Containers 38, no. 7: 32, 34, 38 (July, 1953).

The company recently installed an OCO water system to eliminate completely the discharge of plant effluent and to close the mill water system for the two cylinder board machines which turn out about 150 tons of paperboard

each day at the Baltimore, Md. plant. The system consists of three parallel-operated OCO plate and frame-type filter presses, each with its own Mission feed pump and Syntron filteraid (Dicalite) feeder and Fischer and Porter Flowrator control for regulating the throughput. Paperboard sheets (semi-chemical, chip, or other lightweight sheets) are used between each of the plates inside the filter cloth (used felts); when the filter cake consisting of recovered fiber, filler, and filteraid, is discharged, the board sheets pass along and are returned to the furnish. A single operator is required to run the system. 5 illustrations. E.S.

WOOD

ANON. New uses for man's oldest raw material. Chemurgic Dig. 12, no. 7: 7-9 (August, 1953).

Products of the Weyerhaeuser Timber Co., including Silvacon products, made from bark; Silvacel products, made from fiber; Silvawool, a fiber insulation product; and especially Ply-Veneer (*cf.* B.I.P.C. 23: 826), a sheet of wood veneer sandwiched between two layers of kraft containerboard, are described. 4 illustrations. R.A.S.

SAND, N. H., and CHRISTOPHER, J. F. Pulpwood production in the South, 1946-1952. Southern Pulp Paper Mfr. 16, no. 7: 48, 50, 54 (July, 1953).

Excerpts from the seventh report on the 1952 pulpwood production (Forest survey release no. 72) by the Southern Forest Experiment Station are given. The South with 63 pulp mills (and six new mills under construction) and a total daily capacity of 26,900 tons at the end of 1952 harvested more than 14.5 million cords of pulpwood or 58% of the total domestic pulpwood receipts. Of this amount, about 12% or 1,782,000 cords were hardwoods (principally gums and smaller quantities of oaks, cottonwood, willow, and other species) and 88% or 12,783,000 cords were pine. As a pulpwood producer, the South is slightly more than self-sufficient; it imports no wood and ships small quantities to some northern mills. 1 table and 2 maps. E.S.

WOOD—DECAY

BROWNING, B. L., and BUBLITZ, L. O. Wood deterioration in cooling towers; changes in chemical composition during deterioration. Ind. Eng. Chem. 45, no. 7: 1516-20 (July, 1953).

The composition of redwood specimens which had deteriorated during use in cooling towers was studied to clarify the nature of the deterioration. In samples representing three types of deterioration, a marked enrichment in lignin had taken place, with a corresponding loss of α-cellulose. One sample showed extensive removal of lignin, or delignification, and the α-cellulose content was much higher than that of the unused redwood. Two other types of deterioration were characterized by approximately equal loss of lignin and nonlignin material. Even when no marked deterioration of the wood occurs during use in cooling towers, an extensive loss of alcohol- and water-soluble extractives is observed, and the ash content of the wood is increased. It is not possible on the basis of composition of deteriorated woods to distinguish with assurance between chemical and biological attack; however, the general occurrence of lignin enrichment suggests that more attention be given to biological attack on cooling tower wood. True delignification is usually attributed to chemical action. Chemical analyses will give reliable information regarding the removal of specific constituents, and a few well-chosen analyses serve to establish the general change of composition upon deterioration. 2 tables, 8 figures, and 12 references. E.S.

WOOD—EXTRACTIVES

ERDTMAN, HOLGER. Some heartwood constituents of the natural order *Pinales*. Holz Roh- u. Werkstoff 11, no. 7: 245-51 (July, 1953). [In German] *cf.* B.I.P.C. 23: 285.

This comprehensive review covers material similar to that presented in the previous reference and, in addition, recent work not covered in the first publication. 1 table and 58 references. E.S.

HILLIS, W. E. A chromatographic examination of the minor constituents of various tree zones. J. Sci. Food Agr. 4: 135-48 (March, 1953).

The methanol extracts of the bark, phloem, sapwood, and heartwood zones of 22 hardwood species representing 11 families were examined chromatographically with three different solvents. The trees examined included some without heartwood, one with a wide sapwood, and others with heartwood of pathological and normal origin. The extracts were shown to be complex mixtures, but a ready comparison of the distribution of the minor constituents throughout one tree, and between different samples, was made possible by means of the partition chromatograms. An examination of the kinos and of extracts of the leaves and roots of certain eucalypts failed to reveal any special part played by them. Information from the chromatograms assisted the identification of rutin and ellagic acid. 1 table, 9 figures, and 25 references. E.S.

WOOD—STRUCTURE

WARDROP, A. B., and DADSWELL, H. E. The development of the conifer tracheid. Holzsforschung 7, no. 2/3: 33-9 (1953). [In English; German summary]

The structure of the coniferous tracheid (I) and its development is described and illustrated with photomicrographs and diagrams. The secondary wall, consisting of three layers, is fully described, and the influence of the radial growth rate of the stem on the length of (I) and the organization of the cell wall are discussed. Reference is also made to the relation of these features to certain wood properties and those of the resulting pulp. 1 table, 14 figures, and 28 references. L.E.W.

WOOD ROOM

ANON. Modernized C-Z woodroom. Pulp & Paper 27, no. 7: 62, 64 (July, 1953); *cf.* B.I.P.C. 22: 621.

The second phase of a three-step woodroom modernization at Crown Zellerbach's mill at West Linn, Ore. has been completed this spring. The new addition provides hydraulic means for barking logs up to 30 inches in diameter; small logs up to 12 inches are completely processed, independently of facilities installed for the large logs. This results in increased woodroom capacity and efficiency. Accepted wood in 2-foot lengths is fed to grinders or chippers, whereas dirty or barky wood is returned to drum barkers. Whole-log chippers will be added in the last phase of the program. 7 illustrations. E.S.

WOOD TRANSPORTATION

ANON. New log handling system at H. & W.'s Mobile mill. Paper Trade J. 137, no. 2: 26, 28 (July 10, 1953); Southern Pulp Paper

Mfr. 16, no. 8: 16, 18 (August, 1953); Paper Ind. 35, no. 5: 533-4 (August, 1953).

The new multiple-log conveyor system feeding four barking drums in place of the original two designed by Rust Engineering Co. of Pittsburgh is described briefly. The new conveyors are of heavier construction than is usual and employ a chain of new design. 2 illustrations. E.S.

MERILUOTO, MATTI. Log transportation by rail. Paper and Timber (Finland) 35, no. 6: 259-60, 262 (June, 1953). [In Finnish; English summary]

Finnish railway cars are not suitable for the transport of logs on account of the absence of removable side poles, which complicates the mechanization of the loading process. Successful experiments with bunks provided with detachable side poles are described; trucks could also be converted for log transport by the application of this construction. 4 illustrations. E.S.

WOOD WASTE

EGUND, K. F. Briquetting of wood waste. Norsk Skogind. 7, no. 7: 231-8 (July, 1953). [In Danish; English summary]

The author describes problems in connection with the manufacture of briquets from sawmill waste based on the experience from different countries, particularly the United States and Denmark. The possibility of competing with other types of fuel is considered, not only in periods of emergency, but in the long run, thereby opening a stable and profitable market for wood waste. The importance of pressure, moisture content of the raw material, press temperature, particle size, and the coherence of the briquets during transportation, storing, and combustion are discussed. In conclusion, different press constructions are described. 13 figures and 24 references. E.S.

HAUAN, S. Laboratory refining experiments with sawdust and shavings. Norsk Skogind. 7, no. 6: 192-7 (June, 1953). [In Norwegian; English summary]

The mechanical defibration of sawmill waste (sawdust and shavings) was carried out in a PFI laboratory mill (*cf.* B.I.P.C. 19: 107-8) until a freeness was obtained which corresponded to that of ordinary groundwood pulp. The variables studied included the effect of the size of the chips and the effect of additions of small quantities of sodium hydroxide or lime (about 2% calculated on the chips). The results show that wood waste differs in its suitability as a raw material for the manufacture of fibrous products to the same extent as wood. The addition of small amounts of chemicals (preferably immediately before defibration) results in improved sheetmaking properties; compared at the same beating degree, the addition of lime results in better strength properties than that of sodium hydroxide. The possibilities of adding sawmill-waste pulp to the furnish used in the manufacture of wallboard are discussed, with particular reference to previous studies by Renteln (*cf.* B.I.P.C. 22: 289). 1 table, 7 figures, and 1 reference. E.S.

WEGELIUS, TH. Timely problems in the provision and handling of waste wood and thinnings in the pulp industry. Paper and Timber (Finland) 35, no. 7: 279-84 (July, 1953). [In Swedish; English summary]

Recent high wood prices and production costs force the Finnish pulp industry to investigate the possibilities of using cheap wood waste and

thinnings. Developments along these lines in the United States and Canada are reviewed, and attention is drawn to portable chippers, the bark-separating equipment and Centri-Cleaner of Bauer Bros., high-yield semichemical processes, the Chemigroundwood process, and the new Va-Purge process. The efficient and economical utilization of small wood requires a thorough knowledge of forest biology, transportation problems, and the technical aspects of pulp- and papermaking, hence the collaboration of foresters, engineers, and pulp- and papermakers. 1 table and 5 figures. E.S.

X-RAY RESEARCH

BJØRNHAUG, A., ELLEFSEN, Ø., and TØNNESEN, B. A. Interpretation of x-ray diagrams of unoriented organic chain polymer substances. 3. Regenerated cellulose. Norsk Skogind. *7*, no. 6: 171-4, 176-81 (June, 1953). [In English; Norwegian summary] *cf.* B.I.P.C. 23: 447.

A previously described method (*cf.* B.I.P.C. 23: 135) based upon a one-dimensional Fourier synthesis, has been used for the interpretation of x-ray diffraction photographs of unoriented samples of regenerated cellulose (two viscose films and one viscose filament spun without tension). The structural interpretation of these photographs is not in complete agreement with the classical chain structure described by Meyer; the most characteristic discrepancy is a pronounced maximum in the theoretical curves at ~7 A. which is not present in the experimental curve. The same lack of agreement is found in a comparison with the chain structure suggested by Peirce (*cf.* B.I.P.C. 17: 211-12), or when the staggered-step form of the pyranose ring is changed into a boat form. Molecular model constructions developed by the authors involve some simple variations of the classical chain structure by means of systematic rotations of every other pyranose ring. The repetition period of 10.3 A. is still maintained in these models, but small deformations in the valency angles are thereby introduced. In addition, the space conditions for atoms in neighboring positions on both sides of the glucosidic links are improved with regard to the van der Waals radii of the atoms involved. Theoretical curves based upon these rotated chain-structure models are in better accordance with the experimentally obtained curves with regard to the positions of the maxima, especially in the mentioned region of ~7 A. From these results it seems justified to conclude that a chain structure involving a pronounced rotation (deviating from that of the classical chain) of every other pyranose ring may be an expression for the predominant structure of the cellulose molecules of the investigated specimen. 6 figures and 15 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALKALINE PROCESSES—RECOVERY

TOMLINSON, GEORGE H., and TOMLINSON, GEORGE H., II. Chemical and heat recovery system. Canadian patent 494,697. Filed Aug. 12, 1946. Issued July 21, 1953. 11 claims. Assigned to Howard Smith Paper Mills, Limited.

A cyclic black liquor recovery system which has a high thermal efficiency and low chemical losses also produces substantial quantities of uncontaminated hot water. This corresponds to U. S. patent 2,593,503 (April 22, 1952); *cf.* B.I.P.C. 22: 781-2. 8 figures. W.B.W.

BARKERS AND BARKING

EKLUND, HENRIK J., and MILLER, CLARENCE W. Mechanical log barker. Canadian patent 494,454. Filed May 31, 1949. Issued July 14, 1953. 5 claims. Assigned to D. J. Murray Manufacturing Co.

A mechanical log barker comprises a rotating drum-shaped frame within which are mounted a series of flexible chain elements to engage and abrade the bark from the log. These chain elements are mounted in a helical relation to the axis of the log and in such a manner that rotation of the frame tends to force the chains into engagement with the log. Feed and discharge rolls mounted on either side of the debarking mechanism force the log through the debarker. 6 figures. W.B.W.

KOLPE, OLOF R., and ANDERSSON, OSCAR B. Log debarking machine having whirling and rotating bark-removing tools. U. S. patent 2,646,092. Filed Aug. 29, 1949. Issued July 21, 1953. 3 claims. [Cl. 144-208]

A log debarker comprises a rotatable drum within which arms are swingably mounted, each arm supporting a bark-removing tool on the inner end. This tool consists of a small drum from which project spring-loaded pins that abrade the bark from the log. A chain drive, coupled to the ring gear inside the rotatable drum, causes the bark-removing tools to rotate

rapidly upon rotation of the outer drum. Logs are carried through the debarker by fluted feed rollers. 6 figures. W.B.W.

BOARD

WILLIAMSON, ROBERT V. Method of making lignocellulose pressure molded article. U. S. patent 2,645,587. Filed July 25, 1950. Issued July 14, 1953. 6 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 106-200]

Mixtures of comminuted materials, such as nutshells, straw, rice hulls, corncobs, peanut shells, bagasse, and flax shives, in a dry state and a thermoplastic binder (Vinsol, rosin, etc.) are heated in the absence of oxygen to 200-300°C. until the evolution of considerable smoke ceases. When incorporated in molding compositions for boards, slabs, tile, etc., this material, which remained in the solid state throughout, exhibits an unusual degree of dimensional stability to water or moist environments; a substantial saving is also effected in the amount of resin binder required. W.B.W.

BOARD—SHEET FORMATION

DUVALL, THURE C. Method for dispersing and felting fibers and mill. U. S. patent 2,646,381. Filed Dec. 1, 1949. Issued July 21, 1953. 12 claims. Assigned to Wood Conversion Company. [Cl. 154-101]

A dispersion mill discharges fibers through a special nozzle into a deposition chamber; the floor of the chamber comprises an endless wire belt upon which the mat of felted fibers is formed. Flocculation of the dispersed fibers is reduced by the design of the mill nozzle so that a uniform mat is produced. Binder material may be added to the fiber as a spray or mist of liquid adhesive or as a powder. 7 figures. W.B.W.

BOARD, ASBESTOS

SMOLAK, GEORGE, and DYER, EDWIN F. Lightweight panel and method of manufacture. U. S. patent 2,644,781. Filed Feb. 25, 1950. Issued July 7, 1953. 10 claims. Assigned to Johns-Manville Corporation. [Cl. 154-128]

An inorganic sheet laminate of fireproof construction is formed by felted asbestos with a sheet-metal veneer facing bonded to each side. 4 figures. W.B.W.

BOARD, INSULATING

GONDA, DESIRE. Building unit. Canadian patent 494,753. Filed July 13, 1948. Issued July 28, 1953. 3 claims.

This structural, sound-absorbent panel one or two inches in thickness consists of a perforated front panel (holes ⅛ inch in diameter on 0.5-inch centers) and a back panel interconnected by closely set spacing webs. Kraft paper and a thermosetting resin are preferably used to form the panel from a series of laminated tubes of rectangular cross section bonded together by heat and pressure. With the channels empty, this panel is claimed to have a sound reduction factor of 22 decibels and, when the channels are filled with kapok enclosed in scrim cloth, a sound-absorption coefficient of 0.9 at 1000 cycles/second. 3 figures. W.B.W.

BOARD SPECIALTIES

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,645,403. Filed Jan. 15, 1947. Issued July 14, 1953. 5 claims. Assigned to Morris Paper Mills. [Cl. 229-28]

A paperboard carrier is adapted for carrying a number of bottles arranged in rows on either side of a central suspending member. 7 figures. W.B.W.

ECKLES, HARRY L. Attachable and detachable handle closure combination. U. S. patent 2,645,408. Filed Aug. 8, 1949. Issued July 14, 1953. 1 claim. [Cl. 229-52]

A detachable metal handle frictionally engages the folded closure flaps between portions of the device by sliding over the folded flaps of a paperboard container. The weight of the container and its contents will increase the frictional grip of the handle. 14 figures. W.B.W.

ELLERN, HERBERT. Composition for stiffening paper match splints. U. S. patent 2,647,048. Filed Oct. 28, 1949. Issued July 28, 1953. 1 claim. Assigned to Universal Match Corporation. [Cl. 52-26]

An impregnating mixture for paperboard matches containing white refined paraffin, limed rosin, gilsonite, and a substituted polyamid of stearic acid serves the two-fold purpose of aiding in transfer of the flame from the match head to the splint and substantially increasing breaking strength of the splint. Impregnation is performed just prior to dipping the splints to form the match head. W.B.W.

FORRER, HOMER W. Bottle carrier. U. S. patent 2,646,918. Filed Sept. 30, 1949. Issued July 28, 1953. 4 claims. Assigned to Atlanta Paper Company. [Cl. 229-41]

A paperboard bottle carrier contains cells on either side of a central panel and may be collapsed for storage or erected for insertion of bottles by an automatic machine. The inwardly folding bottom panel tends to hold the carton erect until filled. 7 figures. W.B.W.

GUYER, REYNOLDS. Bottle carrier. U. S. patent 2,644,624. Filed Aug. 5, 1948. Issued July 7, 1953. 6 claims. Assigned to Waldorf Paper Products Company. [Cl. 224-48]

A strip of paperboard is folded to form a U-shaped body which is suspended from a frame with an attached handle. The frame is held in the double-walled sides and may be extended for carrying or retracted for stacking the filled carriers. The paperboard body may be replaced as necessary. 5 figures. W.B.W.

KLEIST, DUDLEY C. Apparel holder for coat hangers. U. S. patent 2,646,195. Filed Aug. 27, 1949. Issued July 21, 1953. 5 claims. [Cl. 223-88]

One edge of a stiff sheet material is rolled into a tubular section to engage the bottom wire of a coat hanger used by cleaning establishments for delivery of clothing. The flat portion of the sheet material hangs vertically and is slotted to receive items such as neckties and dress belts. This holder makes a more suitable support for trousers and helps to prevent the loss of small articles. 4 figures. W.B.W.

NELSON, PAUL E. Hat holder for hat boxes. U. S. patent 2,645,333. Filed March 2, 1949. Issued July 14, 1953. 11 claims. [Cl. 206-8]

A folded and braced paperboard holder consists of opposing tongues which grip the sweat band of a hat. The holder is permanently attached to either the lid or the bottom of the box and positions the hat centrally in the container. 8 figures. W.B.W.

PETTER, NOEL A. Disposable bottle container. U. S. patent 2,644,631. Filed April 30, 1949. Issued July 7, 1953. 9 claims. Assigned to Standard Paper Box Corp. [Cl. 229-28]

A lightweight paperboard carrier is divided into two rows of cells by a medial partition which is perforated at the upper edge to form finger holes. 8 figures. W.B.W.

ROBINS, IRVING. Box. U. S. patent 2,645,406. Filed Feb. 6, 1948. Issued July 14, 1953. 2 claims. Assigned to Add-A-Handle Carton Company. [Cl. 229-52]

A handle with an arrowhead-shaped section at each end is formed from pliable material. The enlarged end of the strap is forced through the slot made near the upper edge at either end of the box straddling the top wall, so that the broad base of the enlarged portion bears against the wall of the box effectively resisting withdrawal. 6 figures. W.B.W.

BOARD TESTING—PHYSICAL

SKALMUSKY, MARVIN F., ROOT, CARLETON H., and MCKEE, ROBERT C. Method of testing sheet materials. U. S. patent 2,645,937. Filed Oct. 28, 1949. Issued July 21, 1953. 1 claim. Assigned to The Institute of Paper Chemistry. [Cl. 73-94]

A method of evaluating corrugating medium is described wherein the sample to be tested is formed into a fluted shape between heated matched dies. The sample is engaged by a clamping device before removal from the die, so that the form imparted by the die is retained. The clamping device, with the engaged sample, is transferred to a testing machine where the flute is placed under compression until failure occurs. 8 figures. W.B.W.

DYES AND DYEING

PITT, FRANCES J. Process of ornamental dyeing. U. S. patent 2,629,647. Filed Feb. 3, 1949. Issued Feb. 24, 1953. 5 claims. [Cl. 8-2.5]

Water-soluble dyes may be applied to textile or paper products by a process which involves treating a compressible, porous, fluid-absorbent body (e.g., unbleached muslin) with the dye, then pressing the dye carrier against the material to be treated. The weight of the transfer medium employed is governed by the amount of dye that must be applied to the product. W.B.W.

FILTERING SPECIALTIES

ANDERSON, LOUIS E. Filter element and method of making the same. Canadian patent 494,625. Filed Aug. 28, 1948. Issued July

21, 1953. 7 claims. Assigned to The Cuno Engineering Corporation.

A method is described for the manufacture of a filter element by the accretion of resin-impregnated fibers (principally wool with up to 40% of esparto, yucca, etc.) to produce an element for filtration of liquids and gases. This is identical with U. S. patent 2,539,768 (Jan. 30, 1951); *cf.* B.I.P.C. 21: 511. 8 figures. W.B.W.

ANDERSON, LOUIS E. Method of and apparatus for making a filter element. Canadian patent 494,624. Filed Aug. 28, 1948. Issued July 21, 1953. 6 claims. Assigned to The Cuno Engineering Corporation.

A method is provided for the manufacture of thick-walled, tubular filter elements by accretion. Wool constitutes the principal fibrous material in addition to which up to 40% of other fibers such as esparto, yucca, asbestos, and the like may be used. This corresponds to U. S. patent 2,539,767 (Jan. 30, 1951); *cf.* B.I.P.C. 21: 511. 4 figures. W.B.W.

FLOTATION

NORDSTRAND, SVEN G. Flotation apparatus. U. S. patent 2,645,350. Filed April 13, 1948. Issued July 14, 1953. 4 claims. Assigned to Ingeniörsfirman Fliesberg Aktiebolag. [Cl. 210-53]

A nozzle for introducing material to be separated into the flotation tank is formed by two disks having parallel or nearly parallel faces. The lower disk is supported by a hollow leg which acts as a liquid inlet, and the upper disk is supported by a spindle which extends downward through the hollow leg. Independent dimensioning of the individual zones permits a considerable reduction in the diameter of the disks for a given capacity. 5 figures. W.B.W.

FOAM

GUNDERSON, LEWIS O. Compounds for altering surface characteristics of liquids. U. S. patent 2,630,439. Filed Aug. 31, 1949. Issued March 3, 1953. 15 claims. Assigned to Dearborn Chemical Company. [Cl. 260-404.5]

Compounds with one or more acetal-type linkages within the molecule and which also contain hydrophilic and hydrophobic radicals in a correct balance to produce the necessary surface activity, act as foam inhibitors. The compositions are suitable for use in boilers, in the processes of paper manufacture, as additives in paper manufacture, and as plasticizers in various industrial products. W.B.W.

MAYHEW, RAYMOND L., and CROSS, JAMES M. Paper pulp foam inhibitor. U. S. patent 2,645,617. Filed Nov. 6, 1948. Issued July 14, 1953. 8 claims. Assigned to General Aniline & Film Corporation. [Cl. 252-321]

An emulsion is formed by mixing 25 parts of an alkyd resin (Paraplex RG-2), 25 parts of palmitic acid, 48 parts of water, and 2 parts of 50% sodium hydroxide solution. This composition reduces foam in paper stock and does not adversely affect sizing as determined by ink penetration tests. W.B.W.

FOLDING BOXES

BERGSTEIN, ROBERT M. Box with carrying handle. U. S. patent 2,645,407. Filed Sept. 1, 1948. Issued July 14, 1953. 5 claims. [Cl. 229-52]

A handle element comprising a strip of stretchable fabric or creped paper is fastened inside a one-piece paperboard suit box or the like with adhesive or other means. The handle may be extended outside the box by passing through a slot in the single- or double-wall top construction. 14 figures. W.B.W.

BOCKMANN, ARTHUR. Folding box. U. S. patent 2,646,915. Filed March 6, 1948. Issued July 28, 1953. 8 claims. [Cl. 229-34]

The inwardly sloping sides of this easily set up box make it practically nontippable and therefore useful for such items as ash trays or pin trays. Paper or paperboard used in the box may be metallized for increased waterproofness and fire resistance. 10 figures. W.B.W.

BUTTERY, KENNETH T. Collapsible cellular carton. U. S. patent 2,645,402. Filed Feb. 12, 1951. Issued July 14, 1953. 3 claims. Assigned to Sutherland Paper Company. [Cl. 229-28]

A cellular paperboard egg carton with two rows of cells separated by a medial partition has a transverse severing line scored into the blank so that the filled carton may be divided into two equal sections, each containing six eggs. 8 figures. W.B.W.

BUTTERY, KENNETH T. Collapsible covered container. U. S. patent 2,645,404. Filed Nov. 21, 1949. Issued July 14, 1953. 6 claims. Assigned to Sutherland Paper Company. [Cl. 229-36]

The box claimed is readily erected from the flat blank and securely locks into the erected position with locking tongues and slots in the end walls. 4 figures. W.B.W.

CLAFF, CLARENCE L. Box. U. S. patent 2,644,632. Filed May 1, 1947. Issued July 7, 1953. 1 claim. Assigned to Norfolk Paper Company, Inc. [Cl. 229-34]

A pocket is formed in one end of the box by flaps of the blank. This pocket holds a removable stock-control tag which may be viewed through a window stamped in the end of the box. 8 figures. W.B.W.

MELLER, REGINALD B. Corner construction for folding boxes. U. S. patent 2,646,916. Filed Nov. 30, 1949. Issued July 28, 1953. 9 claims. Assigned to Bemiss-Jason Company. [Cl. 229-35]

A glueless corner construction for folding boxes comprises a corner flap engaged by a slot in the adjacent side panel, the tongue of the flap extending inwardly through the wall panel. The assembly of this box by completely automatic machinery at rates of 80 to 200 per minute (depending upon box sizes) is claimed to be possible. 12 figures. W.B.W.

SMITH, GEORGE W. Carton and closure therefor. U. S. patent 2,646,917. Filed Feb. 2, 1949. Issued July 28, 1953. 2 claims. [Cl. 229-37]

A rigid carton formed from a rectangular blank comprises a tubular section with an end closure formed by folding extensions of the front and back walls inwardly and at right angles to these walls. The triangular flaps thus formed at the ends of the folded sections are folded back against the side walls and the apexes inserted into Y-shaped slits in the side walls. 8 figures. W.B.W.

STENGER, RICHARD C. Carton for baked goods and other easily broken products. U. S. patent 2,645,337. Filed July 7, 1949. Issued July 14, 1953. 4 claims. Assigned to Sutherland Paper Company. [Cl. 206-46]

A carton for packaging pies and like products has a cover hinged to the rear wall and a tucking flap at the front edge for closing the carton. A transparent window is provided in the cover for viewing the contents. 5 figures. W.B.W.

STOPPER, CHARLES A. Paperboard box construction (hexagonal). U. S. patent 2,644,633. Filed Jan. 8, 1949. Issued July 7, 1953. 3 claims. Assigned to Diamond Paper & Box Company. [Cl. 229-37]

A box in the shape of a hexagonal prism is formed from a one-piece blank. End closures are held in place by tongues attached to the side walls which engage in slots in the end pieces. A handle is formed in one side at the point of overlap of the side panels. 5 figures. W.B.W.

FORGERY

SELGIN, PAUL J. Device for the identification of documents or printed matter. U. S. patent 2,646,717. Filed Sept. 20, 1950. Issued July 28, 1953. 5 claims. [Cl. 88-14]

This device for comparison of an authentic document with a reproduction incorporates a scanning device to produce full register of the document with the reproduction at definite intervals. Light fluctuations transmitted through the negative from the scanning device energize a signal circuit to provide one signal for a true document and a different signal for a false document. 2 figures. W.B.W.

INTERIOR PACKING

GIBBONS, CLYDE F. Flap locking device for container inserts. U. S. patent 2,646,202. Filed Oct. 8, 1949. Issued July 21, 1953. 2 claims. Assigned to Gaylord Container Corporation. [Cl. 229-40]

A paperboard blank is suitably scored to form a series of panels; the bottom panel and overlapping top panels are provided with apertures which engage the upper and lower ends of the cones upon which yarn is wrapped. The top panels are held in closed position by a tab at each end which contains a notch at the hinged base. This notched portion engages the adjacent layer of board when the tab is folded at right angles to the panel. 5 figures. W.B.W.

MEINHARDT, JOHN W. Container with insert. U. S. patent 2,646,201. Filed July 8, 1952. Issued July 21, 1953. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 229-15]

A container of corrugated or solid fiberboard with an insert of the same material for shipment of bread and similar items is claimed. The insert di-

vides the container into upper and lower compartments and is positioned by flaps adjacent to the side walls which bear against the top and bottom walls. Access to the upper and lower compartments is provided by flaps at one end. 2 figures. W.B.W.

PAFFEN, FRED W., and ENGEL, EDWARD M. Carton for yarn packages. U. S. patent 2,646,166. Filed Aug. 25, 1949. Issued July 21, 1953. 2 claims. Assigned to Celanese Corporation of America. [Cl. 206-65]

A carton for shipment and storage of yarn packages with conical cores (bobbins, cones, cheeses, pirns, and the like) contains horizontal separators of a cellulose derivative (i.e., cellulose acetate) with fittings of similar material cemented to the separators. The fittings engage the bottom of the cones above, and the top of the cones below the divider, thus holding the yarn packages in position and out of contact with each other and the sides of the carton. 4 figures. W.B.W.

WHITEHEAD, EARL B. Packaging means. U. S. patent 2,646,165. Filed Nov. 30, 1951. Issued July 21, 1953. 1 claim. Assigned to Atlantic Carton Corporation. [Cl. 206-46]

A carton for shipment and storage of fragile articles, such as Thermos bottles, contains a spacing unit at the bottom which supports the base of the bottle and holds it out of contact with the carton walls. A collar is formed from relatively stiff material and holds the neck of the bottle from the side walls and from the top of the carton. 4 figures. W.B.W.

LATEX, SYNTHETIC

SKEIST, IRVING, and MCFARLANE, SAMUEL B. Stabilizing polymerized methyl vinyl ketone. U. S. patent 2,626,943. Filed Feb. 5, 1949. Issued Jan. 27, 1953. 1 claim. Assigned to Celanese Corporation of America. [Cl. 260-63]

Methyl vinyl ketone is polymerized in an aqueous system with a persulfate catalyst. The resulting latex is stabilized against agglomeration by the addition of sodium bicarbonate in excess of the amount required to neutralize the catalyst. These stabilized latexes are useful as adhesives and sizing agents. W.B.W.

LIGNIN

RICHMOND, JAMES H., BOEHM, ROBERT M., and HUNT, HAROLD R. Process for extraction of lignin. U. S. patent 2,645,633. Filed Nov. 14, 1949. Issued July 14, 1953. 5 claims. Assigned to Masonite Corporation. [Cl. 260-124]

Raw or hydrolyzed finely divided lignocellulose material from wood, bamboo, straw, cornstalks, grasses, and the like is washed with a hot formic acid-water azeotrope to extract the lignin, the azeotrope distilled off for re-use, the lignin dissolved in methylcellulose, and then precipitated therefrom into water. 1 figure. W.B.W.

MACHINERY—BEATERS

HÉRY, EDOUARD, and THORSEN, KRISTEN A. Paper pulp beating engine. U. S. patent 2,647,444. Filed May 25, 1948. Issued Aug. 4, 1953. 3 claims. [Cl. 92-22]

This high-speed beater has a pulp reservoir mounted behind the rotating drum, the lower portion of which contains ports for delivery of pulp between the bedplate and the drum. This is very similar to Canadian patent 471,112 (Jan. 30, 1951); *cf.* B.I.P.C. 21: 514. 4 figures. W.B.W.

JONES, DWIGHT E., and VICKERY, CHARLES H. Beater refiner apparatus. U. S. patent 2,647,445. Filed Dec. 2, 1950. Issued Aug. 4, 1953. 5 claims. Assigned to E. D. Jones & Sons Company. [Cl. 92-24]

A self-contained, transportable unit of welded plate construction for a beater-refiner provides for the inclusion of the roll supports, bedplates, backfall, etc. and the means for adjustment of the various members upon a single base plate. This mechanism may be employed in connection with the conventional beater tub, or a number of units may be connected in series for successive steps in a continuous process. Installation of this unit requires no special foundation structure and is simple and economical. 9 figures. W.B.W.

MACHINERY—CARTON-FEEDING MECHANISM

PAGENDARM, EDWARD J. Feeder for carton blanks. U. S. patent 2,646,983. Filed Jan. 28, 1947. Issued July 28, 1953. 5 claims. Assigned to Bemiss-Jason Company. [Cl. 271-36]

Preformed blanks are stacked on edge in a magazine and fed singly and at any desired interval by frictional engagement with the feed wheel into the machine which forms a carton with interlocking corners. 12 figures. W.B.W.

WILLIAMS, VICTOR G. Process and means for loading carton blanks on the conveyor of a packaging machine. Canadian patent 494,215. Filed March 3, 1949. Issued July 7, 1953. 6 claims. Assigned to Delamere & Williams Company Limited.

A carton-feeding mechanism for high-speed automatic packaging machines includes means for transferring cartons from an adjacent magazine to a conveyor and opening them for filling. This corresponds to U. S. patent 2,601,481 (June 24, 1952); *cf.* B.I.P.C. 22: 959. 16 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

HEYWOOD, VINCENT E. Closure flap folding and envelope stacking mechanism for envelope machines. Canadian patent 494,715. Filed June 28, 1952. Issued July 21, 1953. 4 claims. Assigned to United States Envelope Company.

A simplified closure flap folding means is provided for envelope-making machines. This is the same as U. S. patent 2,612,088 (Sept. 30, 1952); *cf.* B.I.P.C. 23: 216. 16 figures. W.B.W.

LINSTEDT, WILLIAM F. Boxmaking machine. U. S. patent 2,645,984. Filed Aug. 22, 1946. Issued July 21, 1953. 7 claims. Assigned to Kraft Foods Company. [Cl. 93-39]

Collapsed paperboard trays and elongated paperboard strips are supplied to the magazine of this machine. The machine erects the tray, folds the strip into a tubular form, and then inserts the strip into the tray portion. 22 figures. W.B.W.

RAYMOND, JOSEPH H. Paper tube winding apparatus. U. S. patent 2,644,376. Filed Jan. 10, 1952. Issued July 7, 1953. 11 claims. [Cl. 93-79]

A hand-cranked apparatus which winds a paper cone for dispensing confections such as cotton candy is claimed. 7 figures. W.B.W.

SCHWAB, LOUIS. Paperbox covering machine. U. S. patent 2,644,374. Filed Nov. 12, 1948. Issued July 7, 1953. 3 claims. [Cl. 93-54.3]

A machine whereby a cardboard box may be covered with a paper wrapping adhesively coated all over its box-engaging side is claimed. 19 figures. W.B.W.

TRIOLO, LOUIS. Combination lining and edge finishing machine. U. S. patent 2,644,375. Filed June 29, 1951. Issued July 7, 1953. 4 claims. [Cl. 93-62]

Envelope-type containers for phonograph records with one wall of relatively heavy cardboard and the other wall of paper are formed by adhesively securing the paper along three edges to the cardboard wall. 9 figures. W.B.W.

WILLIAMS, IVAN A. Bag handle making machine. Canadian patent 494,211. Filed Dec. 29, 1949. Issued July 7, 1953. 7 claims. Assigned to Cushion Grip National.

A series of resiliently mounted dogs remove individual strips of sheet material (such as metal, cardboard, or wood) from the bottom of the stack and feed it into a punching device where the handles are formed. The feeding mechanism will accommodate itself to the curvature of the strips in the pile. 11 figures. W.B.W.

MACHINERY—CREPING MACHINE

HAAS, RUDOLF. Process and apparatus for the creping or waving of paper and the like. Canadian patent 494,735. Filed May 25, 1950. Issued July 21, 1953. 9 claims. Assigned to Zellstoffabrik Waldhof.

An apparatus for creping paper in two directions is described; it forms corrugations with a grooved roll and a rubber counter roll, with a brake means to retard the paper. This is identical with U. S. patent 2,623,572 (Dec. 30, 1952); *cf.* B.I.P.C. 23: 456. 7 figures. W.B.W.

MACHINERY—CUTTERS

REMBOLD, ALBERT A. Cutting machine. Canadian patent 494,539. Filed July 5, 1952. Issued July 21, 1953. 6 claims.

A small compact cutter of rugged construction for slotting a groove along the edge of single cards or a stack of cards for selective sorting (punched card system) is claimed. 9 figures. W.B.W.

MACHINERY—HEAD BOX

DUNCAN, ROBERT D. Deflocculating roll for paper machine headboxes. Canadian patent 494,201. Filed Aug. 1, 1950. Issued July 7, 1953. 3 claims. Assigned to Canadian International Paper Company.

A cage-type roll comprises bars parallel to the axis of the roll and is mounted within the headbox, so that the lower portion is immersed in the stock. Rotation of the roll in the direction of flow breaks up floc particles that may have formed. 6 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

IRVINE, STUART. Machine for wrapping rolls of paper and the like. U. S. patent 2,644,282. Filed Jan. 16, 1947. Issued July 7, 1953. 8 claims. [Cl. 53-64]

The wrapper sheet with reinforcing strips along each edge is applied by the operator to the roll of paper while it is supported on rollers. A disk for end protection is inserted, and the roll is passed through the machine where the overlapping edges are folded flat against the ends of the roll and held in that position to facilitate the application of end seals thereto. 13 figures. W.B.W.

MACHINERY—PARTICLE-SIZE SEPARATORS

FOX, WILLEM C., and LEEMAN, JAN N. J. Process and apparatus for the separation of materials of different specific gravity and sizes. U. S. patent 2,646,169. Filed Oct. 11, 1948. Issued July 21, 1953. 8 claims. Assigned to Stamicarbon N. V. [Cl. 209-173]

An inverted conical vessel comprises a fluid inlet at the apex aperture, a chute for the introduction of particles to be separated located at the top of the vessel, and a mechanical agitator for mixing the particles and the fluid. Lightweight particles are discharged through a weir at the rim of the vessel, whereas heavy particles settle out through the apex in relation to the velocity of the stream of fluid at the inlet. Constant specific gravity is maintained in the separation zone by a dip tube connected to an air control valve which varies the rate of fluid inlet at the apex aperture. 10 figures. W.B.W.

MACHINERY—PASTING MACHINE

BIXBY, HARRY A. Wallpaper pasting machine. U. S. patent 2,644,424. Filed April 28, 1950. Issued July 7, 1953. 4 claims. [Cl. 118-246]

An applicator roll is operated with its lower portion in the paste receptacle; a wiper roll is positioned against the applicator roll so that excess paste is removed. As strips of wallpaper are passed through the device, a uniform coating of paste is applied. 4 figures. W.B.W.

GAUNT, THOMAS N. Method of sealing waxed containers. Canadian patent 494,737. Filed April 26, 1950. Issued July 21, 1953. 4 claims. Assigned 50% to Satona Limited.

A method is described in which a thermoplastic adhesive is applied before waxing to that portion of the container which is to be sealed; the surfaces are first pressed between two jaws heated sufficiently to soften the adhesive and the wax and then between two cold jaws to set the adhesive and solidify the wax. The jaws of the cold press have an undulating outline so that the seal is corrugated or undulated. 7 figures. W.B.W.

MACHINERY—PULPERS

COWLES, EDWIN. Apparatus for treating paper stock. U. S.

patent 2,645,982. Filed Nov. 14, 1949. Issued July 21, 1953. 6 claims. Assigned to The Cowles Company. [Cl. 92-26]

Stacked rotor and stator blades are alternately and concentrically arranged in this apparatus for the complete defibering of slush stock. The blades are of relatively thin metal so that stapling of the fiber over the forward edge occurs. A fixed space is maintained between the rotor and adjacent stator blades by rings; a clearance of 1/64 of an inch between the blades has been found to give good results when treating stock at 1-2% consistency. 3 figures. W.B.W.

MACHINERY—REFINERS

ROBERSON, CYRUS E. Conical plug refiner. U. S. patent 2,645,983. Filed Feb. 15, 1949. Issued July 21, 1953. 9 claims. Assigned to The Noble & Wood Machine Company. [Cl. 92-27]

As the plug is advanced in this refiner to compensate for wear of the cutter bars, the large shell head may likewise be moved inward to maintain a uniform space between the plug and the large end of the shell. Refining conditions are thus maintained relatively constant despite wear of the bars. A turbulence plug is further provided in the large shell head which may be moved inward to interrupt flow of stock or withdrawn into the head, thereby creating a cavity which induces turbulence. If this plug is flush with the shell wall, stock is ejected slowly and in highly refined condition, whereas if the plug is advanced or withdrawn, stock is ejected rapidly and, consequently, in a less refined condition. 14 figures. W.B.W.

MACHINERY—SCREENS

COWAN, BEN, and CUNNINGHAM, ADAM. Screening and filtering apparatus. U. S. patent 2,638,226. Filed Nov. 8, 1948. Issued May 12, 1953. 4 claims. [Cl. 210-149]

A flat screen containing one or more plates is mounted at an angle of not over 30° in a horizontal channel containing a dilute aqueous suspension of papermaking fibers. The screen is supported (and sealed within the side and bottom walls) by flexible elements in such a manner that the same orbital motion is imparted to the entire screen. Accepted stock passes through the screen and through the horizontal channel, whereas rejected material is carried to the top of the screen where it is collected. By suitable modifications of the opening size in the screen plate and stock consistency a filtering action, rather than a screening action, is obtained. 11 figures. W.B.W.

MACHINERY—SHEET-FEEDING MECHANISM

MITCHELL, WILLIAM E. Multiple sheet feeder. U. S. patent 2,645,479. Filed Aug. 25, 1950. Issued July 14, 1953. 3 claims. [Cl. 271-27]

A sheet feeder particularly adapted for feeding two or more sheets in superimposed relationship to perforators, folders, embossers, etc. is claimed. It will also feed single sheets in a spaced-apart relationship or a predetermined number of sheets in spaced-apart stacks. 10 figures. W.B.W.

MACHINERY—SHEET STACKERS

LONG, HENRY R. Sheet delivery system for presses. U. S. patent 2,645,480. Filed May 22, 1952. Issued July 14, 1953. 10 claims. [Cl. 271-74]

In a delivery method for stacking of light sheets injected in sequence at a

continuous and rapid rate into a delivery zone, a rapid succession of air blasts in the direction of delivery with a simultaneous withdrawal of air from underneath the sheet produces a pressure wave above the sheet which acts as a squeegee. The trapped air is removed, and the sheet is deposited on the stack in a very short time. 5 figures. W.B.W.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

BAXTER, JOSEPH, JR. Vortex separator for pulp. U. S. patent 2,645,347. Filed May 20, 1950. Issued July 14, 1953. 15 claims. Assigned to The Black-Clawson Company. [Cl. 209-211]

The settling chamber of this vortex dirt separator is conically shaped with the inlet tube extending downward almost to the apex. Stock is carried downward through the inlet tube, then deflected upward in a spiral path surrounding the inlet tube and confined for a distance inside a second tube. The space between the top of this confining tube and the top of the settling chamber allows the heavy dirt particles to be thrown outward from the stock, whereupon they settle to the bottom of the chamber for continuous removal. Clean stock continues in the upward spiral around the inlet tube and is collected in an annular chamber for discharge at the top. 3 figures. W.B.W.

STAEGE, STEPHEN A., and GIBSON, ALBERT G. Paper machinery. U. S. patent 2,645,346. Filed May 20, 1950. Issued July 14, 1953. 9 claims. Assigned to The Black-Clawson Company. [Cl. 209-211]

Stock enters the top of the settling chamber with a whirling motion and continues around a core which extends across the upper portion of the enlarged discharge chamber and into the opening of the outlet tube. This opening is located in alignment with and across a discharge chamber from the stock inlet. Dirt is thrown out into the settling chamber at the discharge passage by the centrifugal force and settles to the bottom of the chamber for collection and continuous removal. The straight-through flow without reversal results in effective stock cleaning with a low power consumption. 3 figures. W.B.W.

MATERIALS HANDLING

BLAIR, ROBERT C. Mechanism for handling boards. U. S. patent 2,645,329. Filed Dec. 4, 1950. Issued July 14, 1953. 9 claims. Assigned to The British Plaster Board Limited. [Cl. 198-35]

Plaster board and like sheet materials which are packaged in pairs to protect the finished face of the board are fed onto a conveyor from a magazine. Alternate boards are turned over by a second conveyor and piled on top of the preceding board. The two boards continue on the second conveyor in this superimposed relationship. 11 figures. W.B.W.

RICHTER, JOHAN C. F. C. Pulp storage tower and method of emptying same. U. S. patent 2,645,378. Filed March 5, 1948. Issued July 14, 1953. 14 claims. Assigned to Aktiebolaget Kamyr. [Cl. 222-1]

To remove pulp at 15-20% consistency from a high narrow storage tower requiring little floor space, water is introduced into the bottom of the tower. Air trapped in the pulp makes the pulp mass buoyant, and the pulp is carried to the top of the tower as the flotation liquid is introduced. If there is not sufficient air in the pulp for flotation, air may be introduced at the same

time as the water. The pulp is removed from the top of the tower with a scraper and transported on a conveyor. 2 figures. W.B.W.

MOLDED PULP ARTICLES

HATCH, WILFRED E. Fruit and vegetable container. Canadian patent 494,442. Filed March 8, 1951. Issued July 14, 1953. 2 claims. Assigned to Keyes Fibre Company.

A molded-pulp berry box (containing a small amount of phenol-formaldehyde resin for water repellency) has outwardly sloping side walls and offsets which form shoulders to prevent jamming of the nested containers. 3 figures. W.B.W.

PACKAGING

CONKLE, GORDON A. Two-lamp wrapper. Canadian patent 494,639. Filed Feb. 15, 1950. Issued July 21, 1953. 4 claims. Assigned to General Electric Company.

The object of the invention is to provide a lamp wrapper in the form of a sleeve for holding and protecting a pair of incandescent lamps. This is the same as U. S. patent 2,611,531 (Sept. 23, 1952); *cf.* B.I.P.C. 23: 148. 3 figures. W.B.W.

MOORE, GEORGE A. Package for plural articles. Canadian patent 494,164. Filed Oct. 17, 1950. Issued July 7, 1953. 4 claims.

A wrapper for cigars, cigarettes, etc. made preferably from a foil wax-laminated to paper or board is claimed which enables the successive removal of the articles and the ready rewrapping of the remaining units. As each item is removed from the package, the sides of the wrapper can be torn off along score lines, and the remaining wrapper margins refolded to close the package. 13 figures. W.B.W.

SCHOLL, WILLIAM M. Package for tapelike material. U. S. patent 2,646,877. Filed Nov. 30, 1949. Issued July 28, 1953. 3 claims. [Cl. 206-52]

A package for materials which must be kept sterile until use (i.e., surgical gauze) consists of a hermetically sealed covering enclosed in a box. A paper leader, attached to the gauze and sealed at the point of passage through a slit in the package wall, is pulled to fracture the seal and unroll the bandage contained in the package. 6 figures. W.B.W.

SEIFERTH, OSCAR E. Package. U. S. patent 2,646,357. Filed April 12, 1950. Issued July 21, 1953. 14 claims. Assigned to Oscar Mayer & Co., Inc. [Cl. 99-174]

A package for sausages connected together in links comprises two layers formed by placing adjacent links on opposite sides of a central partition which is an integral part of the paperboard carton. A band, cut from the center of the blank, holds the top layer in place together with an overwrap of transparent sheet material which also permits visual inspection. 7 figures. W.B.W.

SPARKS, GEORGE C. Mailable display package. U. S. patent 2,646,876. Filed Sept. 7, 1951. Issued July 28, 1953. 6 claims. [Cl. 206-46]

The core of this mailing package comprises superimposed layers of heavy

cardboard with areas cut out from the upper edge to receive the article. A wrapper of heavy paper completely covers the core. 9 figures. W.B.W.

PAPER—COATED

MUGGLETON, GERALD D. Apparatus for coating paper. U. S. patent 2,645,201. Filed April 12, 1951. Issued July 14, 1953. 3 claims. Assigned to Combined Locks Paper Co. [Cl. 118-227]

Heavy coating is applied to both sides of a web as it passes over a metal roll. Two rubber-covered rolls oppose the metal roll, thus forming two nips where coating is applied to one side of the sheet at one nip and to the other side of the sheet at the second nip. The usual accessory rolls for distributing the coating evenly are provided for each coating roll. This arrangement avoids the weakening of the web which occurs when the web is coated on both sides at the same point. 1 figure. W.B.W.

STERICKER, WILLIAM. Manufacture of silicate-coated papers. U. S. patent 2,647,069. Filed Jan. 23, 1947. Issued July 28, 1953. 2 claims. Assigned to Philadelphia Quartz Company. [Cl. 117-152]

A process for rendering low-cost paper and paperboard oil and grease resistant and for simultaneously bleaching the sheet material is claimed. Sodium silicate containing peroxide is applied to the sheet while the web still contains about 20% moisture; then the drying process is completed. This is very similar to Canadian patent 471,539 (Feb. 13, 1951); *cf.* B.I.P.C. 21: 519-20. W.B.W.

ZONNER, WILLIAM A. Paper coating machine. U. S. patent 2,645,199. Filed May 11, 1950. Issued July 14, 1953. 14 claims. Assigned to St. Regis Paper Company. [Cl. 118-1]

An automatic control system is provided for a coating machine which moves the rolls to the inactive position in the event of a web failure. Alternate applicator rolls are journalled on a tilting frame arranged to move the distributor roll in and out of contact with adjacent rolls. The applicator rolls are moved by a suitable hydraulic system actuated by the control device. 10 figures. W.B.W.

PAPER SIZING

MACMULLEN, CLINTON W., SHAVER, RICHARD C., and TITUS, ROBERT L. Treatment of papermaking fibers with organosilicon compounds. U. S. patent 2,646,373. Filed Jan. 20, 1950. Issued July 21, 1953. 5 claims. Assigned to Cowles Chemical Company. [Cl. 117-155]

An organosilicon compound (preferably containing an organic radical which is a mixture of amyl and n-butyl groups) in alkaline solution is added to an aqueous suspension of papermaking fibers which has previously been acidified, and the pH is adjusted to 10.5-11 to cause the insoluble organosilicon compound to be deposited on the fibers. Heating to about 60°C. with stirring aids in the deposition. A metal salt of aluminum, ferric iron, or cupric copper is added and the pulp allowed to stand six hours or longer at room temperature at a pH of 6-6.4; the suspension is then formed into paper in the usual manner. Curing the dried paper at an elevated temperature (160°) is required to complete the polymerization. Papers sized in this manner exhibit substantial water-resistance and wet-strength improvement. W.B.W.

REES, LANCELOT H. Process of treating amylaceous materials by pressure homogenization. U. S. patent 2,635,068. Filed Oct. 17, 1949. Issued April 14, 1953. 22 claims. Assigned to Manton-Gaulin Manufacturing Company, Inc. [Cl. 195-21]

Starch solutions are prepared by heating an aqueous suspension just above the gelling temperature, then forcing it at high pressure (400 to 5000 p.s.i.) through a restricted orifice to impinge at high speed on a hard surface. Starches so prepared are useful as sizing agents in textile and paper manufacture. W.B.W.

PAPER SPECIALTIES

ATKINS, SAMUEL L. Drinking vessel. U. S. patent 2,646,200. Filed Dec. 6, 1945. Issued July 21, 1953. 1 claim. [Cl. 229-7]

A paper composition drinking cup is claimed, with holes near the top forming a strainer and a foldable spout of the same material adhesively attached on the side and bottom edges to the outside of the cup. 7 figures. W.B.W.

BARKER, ALVIN. Novelty greeting card. U. S. patent 2,645,481. Filed Feb. 28, 1949. Issued July 14, 1953. 5 claims. [Cl. 272-27]

A folded greeting card contains an action device which is actuated by opening the card. 5 figures. W.B.W.

BAXTER, ERNEST L. Backing paper for roll photographic film. U. S. patent 2,646,365. Filed Sept. 27, 1950. Issued July 21, 1953. 2 claims. Assigned to Eastman Kodak Company. [Cl. 117-14]

A single sheet of black kraft paper (as opposed to the duplex paper now used) is coated with carbon black in a zein binder, then with zein and various pigments in successive coatings as required for the roll film backing strip. Strength and opacity equal to that of duplex papers now used is claimed. 2 figures. W.B.W.

BAXTER, ERNEST L. Backing paper for roll photographic film. U. S. patent 2,646,366. Filed Dec. 8, 1951. Issued July 21, 1953. 2 claims. Assigned to Eastman Kodak Company. [Cl. 117-14]

This is very similar to the preceding U. S. patent 2,646,365 (July 21, 1953). 2 figures. W.B.W.

BLIZARD, WALTER S. Method of producing paper bags. U. S. patent 2,645,166. Filed Aug. 5, 1950. Issued July 14, 1953. 2 claims. Assigned to Wolf Brothers, Inc. [Cl. 93-35]

A bag with rounded corners is formed, around which hosiery may be wrapped without danger of snagging. 8 figures. W.B.W.

BRADY, CHARLES V., and WILLIAMS, RUSSELL J. Bag. U. S. patent 2,646,203. Filed June 9, 1949. Issued July 21, 1953. 2 claims. Assigned to Bemis Bro. Bag Company. [Cl. 229-53]

This bag comprises a lower section of paper adhesively joined to an upper section of woven perforated material (e.g., wet-strength paper yarn). The upper section provides for ventilation and viewing of the contents and contains a draw string for closure. 3 figures. W.B.W.

COOLEY, AUSTIN G., and DALTON, HAROLD R. Telefacsimile recording and duplicating paper and method of making same. U. S. patent 2,638,422. Filed Feb. 10, 1951. Issued May 12, 1953. Assigned to Timefax Corporation. [Cl. 117-36]

This recording paper employs a base of electrically conducting or electrically insulating paper, depending upon the type of recording equipment used. A coating of electrically conductive carbon with a transferable dye in a water-soluble binder is first applied, and then a very thin solvent-diluted (masking) coating over the first coating. The electrical discharge produced by the stylus locally removes the second masking coat. 3 figures. W.B.W.

DAVIS, CHESTER, and THACKER, NED A. Transfer paper. U. S. patent 2,646,367. Filed June 28, 1951. Issued July 21, 1953. 2 claims. Assigned to The National Cash Register Company. [Cl. 117-36]

A transfer paper comprises a sheet coated on the reverse side with a low polar wax containing a colorless recording oil which carries a colorless color-reactant material. The color reactant is made up of 50% crystal violet lactone and 50% benzoyl leuco methylene blue. A sensitized receiving sheet, coated with attapulgite or sodium zeolite in a suitable binder, such as starch, casein, or latex, is likewise colorless until the oil-carried color-reactant is adsorbed on the coating. The sensitized receiving sheet is more fully described in U. S. patent 2,548,364 (April 10, 1951); *cf.* B.I.P.C. 21: 673. W.B.W.

GRESHAM, WILLIAM F. Polymers of formal esters. U. S. patent 2,630,424. Filed Dec. 13, 1949. Issued March 3, 1953. 6 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 260-78.3]

Linear formals containing two of more hydroxyl or formal groups may be polymerized to give products having a wide range of physical and chemical properties. Some of these polymers are useful in the paper industry as sizing agents for waxing, as a substitute for natural waxes in carbon paper, as plasticizers, as a coating for paper insulators and condensers, for transparentizing paper, and as wet-strength agents. W.B.W.

MORHARD, JOSEF K. Sanitary towel or lady's band. U. S. patent 2,644,454. Filed Dec. 18, 1950. Issued July 7, 1953. 1 claim. Assigned to Vereinigte Papierwerke Schickedanz & Co. [Cl. 128-290]

A body of absorbent cellulose wadding is covered by a number of thin layers of cellulose fleece to act as a distributing layer. A nonabsorbent distribution layer on the outside of the pad prevents penetration of fluids through the pad. 4 figures. W.B.W.

PARMENTIER, ROBERT R. Process of transparentizing paper. U. S. patent 2,646,369. Filed Oct. 18, 1950. Issued July 21, 1953. 8 claims. [Cl. 117-92]

A transparentizing composition containing light refined mineral oil, toluene, and carbon tetrachloride is applied to paper. Before this has dried completely, a sealing composition is applied which consists of petroleum wax, gasoline hydrocarbon fraction, and carbon tetrachloride. Paper treated with the above may be employed in an Ozalid machine to produce the desired number of prints. W.B.W.

PARMENTIER, ROBERT R. Sealing composition for transparentized paper. U. S. patent 2,646,363. Filed Oct. 18, 1950. Issued July 21, 1953. 3 claims. [Cl. 106-271]

This is very similar to U. S. patent 2,646,369 (July 21, 1953). W.B.W.

WEITZNER, GEZA. Self-contained envelope opener and contents ejector. U. S. patent 2,644,634. Filed April 22, 1950. Issued July 7, 1953. 1 claim. [Cl. 229-86]

An envelope construction is claimed in which a pull string is attached to the enclosed article in such a manner that the envelope can be quickly opened and the contents removed in a single motion without the necessity of touching the article (i.e., tea bag, greeting card, surgical dressing, etc.). 20 figures. W.B.W.

PAPER SPLICING

GERMAIN, LEO M. Process for splicing paper. Canadian patent 494,300. Filed March 3, 1953. Issued July 7, 1953. 3 claims. Assigned to Shawinigan Chemicals Limited.

A polyvinyl acetate film is interleaved between the overlapped ends of the two webs, and the splice completed by heat sealing. This is the same as U. S. patent 2,587,833 (March 4, 1952); *cf.* B.I.P.C. 22: 640. W.B.W.

PURIFIED WOOD FIBER

BATE, STANLEY C. Purifying wood pulp. U. S. patent 2,645,576. Filed Feb. 11, 1949. Issued July 14, 1953. 2 claims. Assigned to Celanese Corporation of America. [Cl. 92-13]

Wood, straw, or other cellulosic material pulped by one of the conventional methods to about 85% α-cellulose is further purified to an α-cellulose content of 92-95% with an alkali treatment. Concentrations of alkali may vary between 17 and 19% (based on dry fiber) with temperatures from 40 to 60°C. The alkali is removed by filtration, washing with hot water of 80°, acidified water, and again with water alone until the effluent is neutral. This pulp is suitable for esterification. W.B.W.

BATE, STANLEY C., PEACH, FRANCIS G., and ROGERSON, WALTER A. Purifying wood pulp. U. S. patent 2,645,577. Filed April 8, 1950. Issued July 14, 1953. 4 claims. Assigned to British Celanese Limited. [Cl. 92-13]

This is very similar to U. S. patent 2,645,576, except that a boil with water is employed after washing or as a part of the last washing procedure described in the preceding patent. This addition makes the pulp especially suitable for esterification treatment. W.B.W.

RAYON—VISCOSE PROCESS

TORKE, ERICH, and MATTHAES, WERNER. Method for making readily filterable viscose. U. S. patent 2,647,114. Filed Dec. 2, 1950. Issued July 28, 1953. Assigned to Phrix-Werke, A. G. [Cl. 260-217]

An alkali cellulose produced by the impregnation of cellulose with a 16-26% caustic solution is converted into readily filterable viscose by xanthation with carbon disulfide at 20-40°C. Prior to xanthation, the alkali cellulose is diluted with a caustic solution, and additional diluent is added during the process. W.B.W.

SETUP BOXES

CARPENTER, ALBERT J., JR. Shipping and display box hinge construction. Canadian patent 494,789. Filed Nov. 2, 1950. Issued July 28, 1953. 3 claims. Assigned to Babcock Box Co., Inc.

A metal, piano-type hinge for jewelry boxes comprises an upper and lower hinge plate, each of which is welded or soldered to a metal strip that extends around the inside of the box or cover to act as a reinforcing member. The hinge and reinforcing member are concealed by the paper covering of the box. 4 figures. W.B.W.

CLAFF, CHESTER E., and MOELLER, CARL A. Reinforced tray. U. S. patent 2,646,914. Filed June 6, 1947. Issued July 28, 1953. 2 claims. Assigned to Norfolk Paper Company, Inc. [Cl. 229-32]

The cover for a cardboard box, such as a shoe box, is reinforced to withstand rough usage by the insertion of a cord in the edge of the blank before forming into the cover. This cord is adhesively secured in a formed groove, and the cover paper is folded over the edge. 11 figures. W.B.W.

SHIPPING CONTAINERS

DORFMAN, IRVING. Collapsible and reusable carton. U. S. patent 2,645,405. Filed May 6, 1950. Issued July 14, 1953. 1 claim. Assigned to Federal Carton Corporation. [Cl. 229-38]

A carrying case or carton may be easily set up from the flattened condition and easily collapsed pending re-use. A double-end panel provides a stiffened construction for stacking, and the top closure is accomplished by tuck-in flaps to allow repeated opening and closing. 4 figures. W.B.W.

SIDING

MILLER, JOHN E. Method of and means for producing simulated-brick siding boards. U. S. patent 2,644,768. Filed Oct. 26, 1950. Issued July 7, 1953. 12 claims. Assigned to Certain-teed Products Corporation. [Cl. 117-9]

Insulation board is impregnated with a thermoplastic material, a thermoplastic material is coated on one face, and mineral particles are applied and pressed into contact with the coated surface. Mortar lines are outlined with slate particles of a contrasting color; these areas are then pressed into holding engagement with the thermoplastic coating material. 15 figures. W.B.W.

SULFITE PROCESS—MAGNESIUM BASE

CUNNINGHAM, GEORGE L. Sulfite waste treatment process. U. S. patent 2,644,748. Filed Nov. 4, 1946. Issued July 7, 1953. 6 claims. Assigned to Chempatents, Inc. [Cl. 92-2]

Sulfite pulping is carried out using a mixed calcium and magnesium base (dolomite). The spent liquor is neutralized with dolomite, and the calcium sulfite formed is separated and returned to the acid tower. The neutralized spent liquor is then rendered calcium-free by treatment with carbon dioxide (e.g., from cooking acid tower) and burnt dolomite rich in magnesium salts and removal of the precipitated calcium carbonate. The calcium-freed magnesium-base spent liquor is then evaporated and burned to yield sulfur dioxide for re-use with further dolomite and magnesia as a by-product. 1 figure. D.H.

TALL OIL

FLOYD, DON E. Plastic tall oil rosin fraction. U. S. patent 2,647,888. Filed Nov. 19, 1949. Issued Aug. 4, 1953. 6 claims. Assigned to General Mills, Inc. [Cl. 260-97.5]

Esterification of the tall oil rosin acid fraction with an excess of polyhydric alcohol results in the formation of light-colored, viscous liquids, having low acid numbers and containing reactive hydroxyl groups; the products can be pumped at room temperature or with slight warming. These products are suitable for further transformation into varnishes, alkyds, resins, and the like. W.B.W.

VANILLIN

PEARL, IRWIN A. 2,3-Bis-(oxybenzyl)-butane derivatives. U. S. patent 2,644,822. Filed Aug. 26, 1949. Issued July 7, 1953. 7 claims. Assigned to Sulphite Products Corporation. [Cl. 260-340.9]

2,3-Bis(oxybenzyl)-2,3-butanediols useful for the preparation of 2,3-bis (oxybenzyl)-2,3-butanes such as nordihydroguaiaretic acid (a valuable antioxidant) are prepared by reducing with sodium or aluminum amalgam the corresponding benzyl methyl ketone which in turn is obtained by condensation of the parent aldehyde with nitroethane and reductive hydrolysis of the beta-nitro-1-propenylbenzene intermediate. Thus vanillin is condensed with nitroethane to give 4-hydroxy-3-methoxy-beta-nitro-1-propenylbenzene which is reduced and hydrolyzed to vanillyl methyl ketone. The latter compound is reduced with sodium amalgam to give 2,3-bis(4-hydroxy-3-methoxybenzyl)-2,3-butanediol which can be reduced and demethylated to give nordihydroguaiaretic acid. I.A.P.

PEARL, IRWIN A. Vanillimino ethyl ether and its salts of anhydrous acids. U. S. patent 2,644,830. Filed March 22, 1951. Issued July 7, 1953. 5 claims. Assigned to Sulphite Products Corporation. [Cl. 260-453]

Ethyl vanillate is produced from vanillin via vanillimino ethyl ether without first producing vanillic acid. Vanillin is condensed with hydroxylamine to form vanillin oxime which is dehydrated to acetylvanillonitrile. This compound is partially hydrolyzed to vanillonitrile which is treated with ethanol and hydrogen chloride to yield vanillimino ethyl ether hydrochloride. Boiling of this compound with water yields the desired ethyl vanillate. Other acids may be employed to yield other salts of vanillimino ethyl ether. I.A.P.

WAXES

CAPELL, ROBERT G., RIDENOUR, WILLIAM P., and STEWART, JOHN A. Paraffin wax composition. U. S. patent 2,646,362. Filed June 30, 1950. Issued July 21, 1953. 6 claims. Assigned to Gulf Research & Development Company. [Cl. 106-270]

Oxidation of paraffin wax by heat can be inhibited, and the temperature to which it may be safely heated can be raised by the addition of small quantities of hydroquinone monobenzyl ether. W.B.W.

WET STRENGTH

YOST, ROBERT S., and AUTEN, ROBERT W. Methylol derivatives of ureidopolyamines. U. S. patent 2,616,874. Filed July 19, 1951. Issued Nov. 4, 1952. 12 claims. Assigned to Rohm & Haas Company. [Cl. 260-70]

A resinous composition useful for improving wet strength of paper is pre-

pared in several steps by reacting a dihaloalkane such as ethylene dichloride and a polyethylene polyamine of a molecular weight of at least 146, such as triethylenetetramine at 70 to 150°C. The polyamine hydrohalide is converted to free polyamine by adding an excess of alkali. This reaction product is then heated with urea to 100 to 200° until a 50% aqueous solution of the condensate shows a Gardner-Holdt viscosity of about B to M at 25°. Formaldehyde is reacted with the above to form a resinous condensate that may be used in the solution form or spray dried. W.B.W.

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